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NIGERIA

SELECTED ISSUES

December 14, 2021

Approved By
African Department

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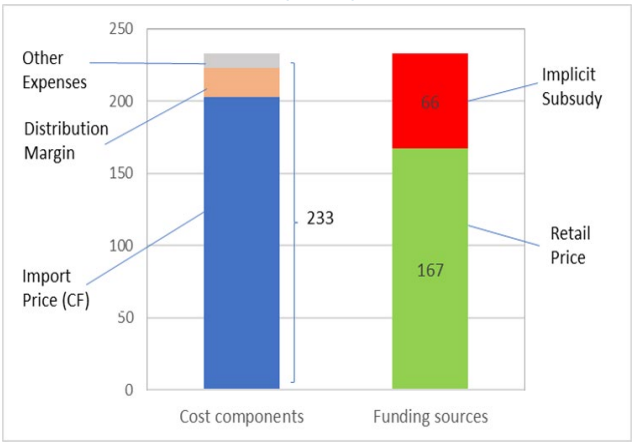
THE IMPACT OF FUEL SUBSIDY REEMERGENCE IN NIGERIA[1]

A. Reemergence of Implicit Fuel Subsidy in Nigeria and Its Estimates

1. Since January 2021, the Nigerian government has reverted back to providing implicit fuel subsidies. In June 2020, the Nigerian federal government (FGN) announced that it removed the fuel price cap.[2] However, it did not follow through with introducing a market-based pricing mechanism and, as oil prices rose, considerable fiscal costs built up from implicit subsidies resulting from the difference between higher prices of imported fuel products and regulated pump prices. As there is no provision for subsidy payments in the 2021 budget, such costs are being borne by the national oil company (NNPC), which are deducted from the oil revenues accruing to the Federation Account.

2. Implicit fuel subsidies are estimated at NGN 1,912 billion for 2021. As shown in Figure 1, the cost (NGN 233) of delivering a liter of Premium Motor Spirit (PMS) in 2021 has exceeded the regulatory retail price (NGN 167) by around 40 percent. The gap (NGN 66) is estimated as a proxy for implicit fuel subsidy per liter of PMS. At this level of price under-recovery and with the assumption for consumption of about 54 million liters per day in Nigeria, the annual implicit subsidy cost is estimated at NGN 1,912 billion in 2021. Detailed methodology to calculate the implicit fuel subsidy is presented in Box 1. Monthly fuel subsidies started to accumulate in January 2021 and have continued through now (Figure 2).[3] Most of the subsidies are for PMS, although fuel oil price is also subsidized. There is no subsidy for kerosene (a cooking/heating fuel used mainly by poorer households) whereas the PMS subsidy (used more by richer households) is very large, implying a "regressive" pricing policy, which will be discussed in the next section.

Figure 1. Decomposing Cost of One Liter of PMS
(Naira)



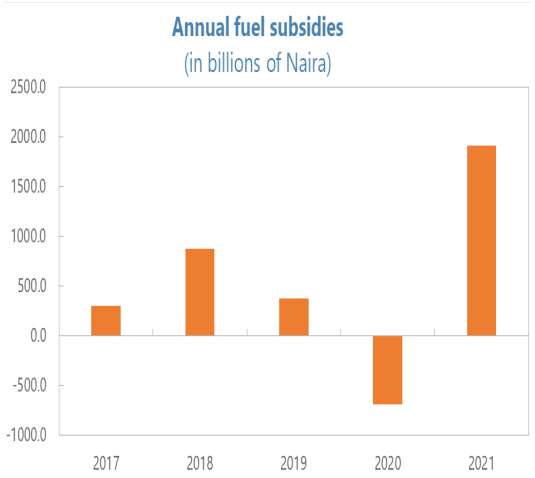
Note: Average cost per liter in January-September 2021

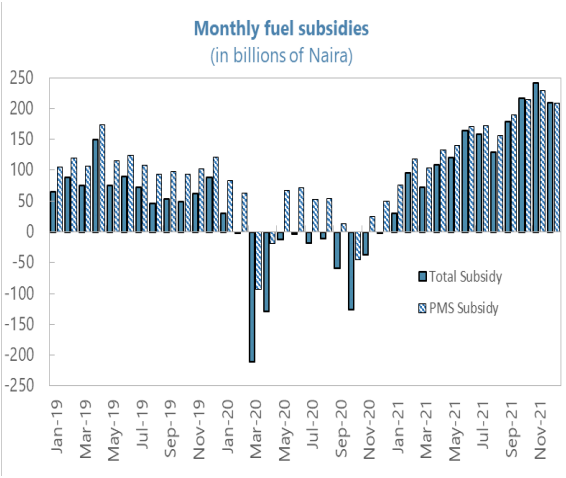
[1] Prepared by Il Jung (FAD).

[2] Sources: "Nigeria's president confirms removal of gasoline subsidies" (S&P Global, Jun. 5, 2020).

[3] Premium Motor Spirit (PMS) subsidy has reemerged since November 2020, and the aggregated subsidy (PMS and fuel oil) has reemerged since January 2021.

Figure 2. Estimates for Implicit Fuel Subsidies





Sources: IMF staff estimates.

Box 1. Methodology to Calculate Implicit Fuel Subsidy

This Box outlines the methodology used to calculate implicit fuel subsidies during 2017-2021 in Nigeria since demand prices were made available in 2017. The implicit fuel subsidies are calculated for the Premium Motor Spirit (PMS) and an aggregate of PMS and fuel oil. The basic idea is to compare the cost of the refined fuel products with the demand price on the national market. The cost is defined as follows:

$$C = Pwop * (1 + Pd) * End * Do \qquad (1)$$

where *Pwop* is the world price for Nigeria bonny per barrel, *Pd* is the cost of landing fees and product distribution, *End* is the naira per dollar market-based exchange rate and *Do* is the demand for the refined oil products. The demand for PMS is available monthly through February 2021 from the NNPC website. Since February 2021, we assume that demand is flat for the rest of the year, but the data is updated as soon as it is made available. Demand for fuel oil is not readily available. For this item, we have annual data from the U.S. Department of Energy through 2018 and electricity growth assumptions for 2019-21 are made, based on real GDP growth, to project demand through end 2021. The cost is projected forward through end-year using futures oil prices and a fixed market exchange rate level. The demand value relationship is as follows:

$$Dv = Pm * Do \qquad (2)$$

where *Pm* is the (regulated) national market price for PMS and *Do* is the demand for the refined oil products.

The fuel subsidy is estimated as the gap between the two ((1)-(2)):

$$S = C - Dv \qquad (3)$$

B. The Impact of Fuel Subsidy Reemergence: Fiscal and Distributional Impact

3. Implicit fuel subsidies have a significant negative impact on Nigeria's fiscal position, which is estimated to increase the overall fiscal deficit by around 1 percentage point of GDP in 2021. Despite much higher oil prices, the general government fiscal deficit is projected to be significantly worse at 6.3 percent of GDP (Table 1), compared to 4.7 percent of GDP in the 2020 Article IV staff report, mainly reflecting the reemergence of implicit fuel subsidies and higher spending in the supplementary budget for security and vaccine costs. Over the medium-term, without bold reforms for tax administration and tax policy, fiscal deficits are projected to stay elevated above pre-crisis levels (4.3 percent of GDP during 2014-19). Even though we assume that implicit fuel subsidies exist only until mid-2022, as stipulated in the Petroleum Industry Act (PIA) and assumed in the draft 2022 budget, fiscal vulnerabilities remain elevated with public debt continuously increasing from 35 percent of GDP in 2020 to over 42 percent in 2026. With limited IFI funding, fiscal financing for large implicit subsidy costs is likely to depend heavily on domestic sources, including overdrafts from the Central Bank of Nigeria (CBN). Thus, the recent reemergence of implicit fuel subsidies has levied a considerable burden on the Nigeria's fiscal position, that could have been spent more effectively on pro-poor interventions.

Table 1. Fiscal Indicators and Medium-term Projections, 2020-2026
(in percent of GDP)

	2020	2021	2022	2023	2024	2025	2026
Total Revenue and Grants	6.3	7.4	7.0	6.8	6.7	6.7	6.6
Oil Revenue	2.2	3.0	2.6	2.3	2.1	2.0	1.9
Non-Oil Revenue	4.1	4.3	4.3	4.4	4.5	4.6	4.7
Total Expenditure	12.0	13.7	13.4	12.4	12.6	12.8	12.9
Implicit Fuel Subsidies[1/]	0.1	1.0	0.5	-	-	-	-
Overall Balance	-5.7	-6.3	-6.4	-5.7	-5.9	-6.2	-6.3
Gross Public Debt	34.5	36.0	37.5	38.5	40.0	41.5	42.9

Sources: IMF Staff Projections and Nigerian Authorities.
[1]/ In line with the enacted PIA and the draft 2022 budget, the baseline assumes no fuel subsidies beyond mid-2022.

4. The analysis shows that removing fuel subsidies would reduce income inequality.[4] A fuel price increase to cost-recovery level would reduce households' purchasing power, which calls for a distributional analysis of the impact by income groups, especially for poor households. Richer households tend to spend a larger share of their income on PMS than poorer households, while the share of kerosene expenditure is lower in richer households (above 80th income percentile) (Figures 3 and 4). The price of kerosene—a cooking/heating fuel used mainly by poorer households—is

[4] This section is based on the analysis of IMF (2019) "Nigeria: Selected Issues, Fuel Subsidies–Latest Increase and Implications of a Change in the Regulated Gasoline Price".

higher than the subsidized price of PMS, which implies that the existing implicit fuel (PMS) subsidy is "regressive" (Figure 5). Empirical studies have also supported that fuel subsidy is inequitable, finding that it is an extremely costly approach to helping the poor, with the top income quintile typically capturing six times more in subsidies than the bottom (Arze del Granado, et. al., 2012).[5] Not surprisingly, the removal of fuel subsidies is therefore progressive. According to IMF (2019) that estimated the distributional impact of fuel price increase in Nigeria[6], a 40 percent increase in PMS price (recovery of current costs) reduces the disposable income of rich households and decreases income inequality (measured by the Gini coefficient) by ¼ point.

Figure 3. Share of Petroleum Expenditure by Income Percentile

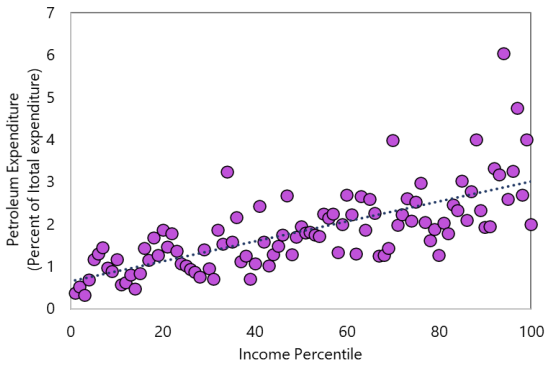
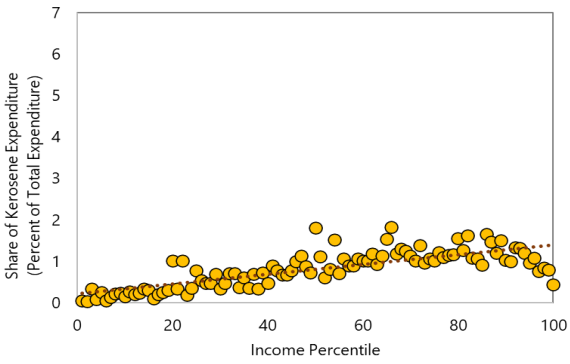


Figure 4. Share of Kerosene Expenditure by Income Percentile



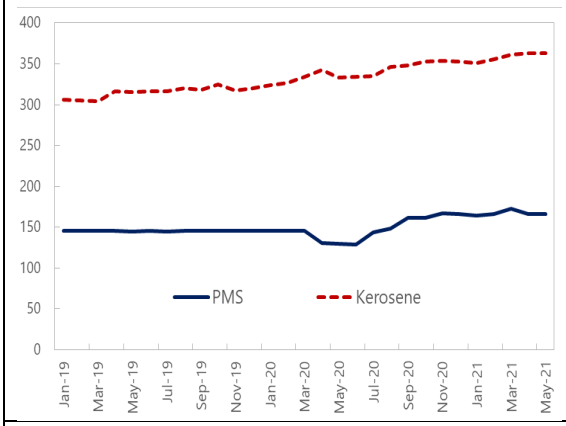
Sources: National Bureau of Statistics and IMF (2019).

5. There is however adverse impact on the poor, which can be mitigated with a fraction of the fiscal resources currently devoted to fuel subsidies. IMF (2019) shows that removing fuel subsidies would increase the headcount poverty rate by 1.2 percentage point and the poverty gap by 0.4 percentage point (Figure 6). Simulations show a scenario (i.e., (2) of Figure 6) that keeps the poverty headcount constant, would need transfers equivalent to NGN 239 billion (0.13 percent of 2021 GDP)—much less than potential savings generated from the fuel subsidy removal (1 percent of GDP in 2021). This scenario would reduce both income inequality and poverty gap further by around 1.3 and 1 percentage points, respectively.

[5] See Arze del Granado, Coady and Gillingham (2012), "The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries". They estimated the welfare impact for 20 countries in Africa, Asia, the Middle East, and Latin America.

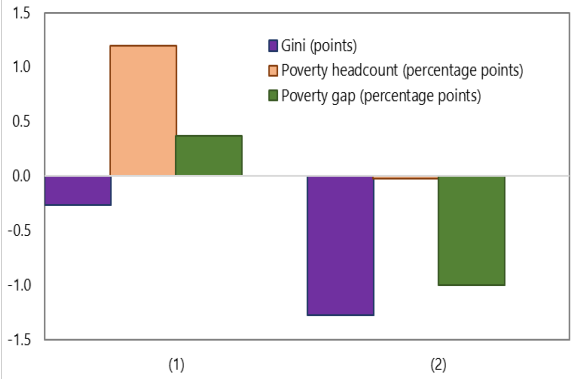
[6] See IMF (2019), which assess the impact of a 40 percent increase in fuel price (recovery of costs) on households' budgets, based on the Nigeria's General Household Survey data and, etc. It calculated both the direct effects (for consumers of fuel) and the indirect effects (for consumers of goods and services that use fuel as an input).

Figure 5. PMS and Kerosene Prices
(Naira)



Sources: Nigerian authorities.

Figure 6. Distributional and Poverty Impact of a Fuel Price Increase



(1) Impact of the fuel price increase to cost-recovery levels
(2) As in (1), but transfers to the poor to keep poverty headcount constant
Source: IMF (2019).

6. The impact of fuel price increase is expected to be overall positive if compensatory measures to protect the poor are adequately introduced. Thus, social safety nets (compensatory transfer to the poor) should be scaled up as a mitigating measure to protect the vulnerable when the government implements fuel subsidy reforms. In the staff's recommended scenario, the authorities could increase social spending. by up to 1 percent of GDP cumulatively for 2022-2026 (around 0.2 percent each year) through scaling up of well-targeted cash transfers, in consultation with the World Bank, who is also working to strengthen the delivery system through digitalization and integration of various state-level registries. Some of these could be used to cushion the negative impact on the poor from removal of fuel subsidies. Moreover, this analysis does not consider other potential positive impacts of the price increase on productive expenditures (e.g., infrastructure) that could have positive growth and distributional implications that would help compensate for adverse effects.

C. Nigeria's Fuel Subsidy Reforms: Developments, Reversals, and Lessons

7. Nigeria has previously attempted removal of fuel subsidies without success. Nigeria's fuel subsidies were introduced first in 1977 as a temporary fiscal response to an oil price spike, but the subsidies were continuously retained by subsequent governments (IISD, 2016). Especially, when international oil prices rise—as they did between 2000 and 2012 (with the exception of the period following the financial crisis)—the subsidy bill escalated rapidly. Since 1999, there have been attempts for upward adjustment of fuel price which have often been accompanied by civil unrest and protests. The Nigerian government has attempted to reform subsidies several times, but it has not succeeded, mainly due to a strong popular opposition to reform (Nwachukwu, et. al., 2013) and the coalition of interest groups that had worked to protect the subsidies (Akov, 2015). Moreover, the reforms were done simply by increasing to a new regulated price instead of introducing a market-

based pricing mechanism. As a result, fuel subsidies always reemerged particularly following currency depreciation and related increase in inflation (McCulloch, 2021). This section will present experiences from two of Nigeria's past attempts towards subsidy reform, in 2012 and 2016, to seek lessons for the current context.

8. The 2012 fuel subsidy reform had a mitigating measure (SURE program) but faced strong political resistance. On January 1, 2012, Nigeria's federal government (FGN) raised the gasoline price to a cost-recovery level, more than doubling the price from NGN 65 to NGN 145 per liter to completely remove the subsidy (IMF, 2013). Also, to mitigate the negative impact of subsidy removal on the poor, the authorities announced the SURE (Subsidy Reinvestment and Empowerment) program including a variety of social safety net programs (Box 2). However, this reform led to widespread protests and a national strike in Nigeria, with many people dead in violent demonstrations. The protests did not end until the government partially reversed the reform by lowering the fuel price back to NGN 97 per liter on January 15, 2012 (IMF, 2013). The details of the 2012 reform are explained in Box 2 below.

Box 2. 2012 Fuel Subsidy Reform, SURE Program and its Reversal[1/]

Nigeria's 2012 fuel subsidy reform

In mid-2011, the Nigerian government decided to radically curtail gasoline subsidies and pursued a campaign to convince the public during the rest of the year. The debate on subsidy removal was initially supported by several state governors, who wanted to free up resources to be able to pay their civil servants the new minimum wage. This proposal was hotly debated in the press, civil society, and the National Assembly. On January 1, 2012, the government raised the gasoline price from NGN 65 to NGN 145 per liter (a 117 percent increase) to completely remove the subsidy.

The SURE program as a mitigating measure

At the core of the government's campaign was the SURE program, which was announced in November 2012, being preceded by public statements by the President and highlighted in budget documents. The program outlined a variety of social safety net programs to mitigate its impact on the poor, as well as the creation of a specific subsidy savings fund as follows:

Category	Main Contents
Measures to protect the most vulnerable	(i) "*Urban mass transit*": increasing mass transit availability by facilitating the procurement of diesel-run vehicles and importing 1,600 buses within months. (ii) "*Maternal and child health services*": expanding the conditional cash transfer program for pregnant women in rural areas and upgrading facilities at clinics. (iii) "*Public works*": providing temporary employment to youth and women from the poorest and maintaining education and health facilities. (iv) "*Vocational training*": establishing vocational training centers across the country to tackle the problem of youth unemployment.
Subsidy savings fund	The program envisaged the creation of a specific subsidy savings fund to finance its spending, which would be overseen by an 18-person Board.

Box 2. 2012 Fuel Subsidy Reform, SURE Program and its Reversal[1/] (Concluded)

Political resistance and reform reversal

The Nigerian government's attempt to remove subsidy faced with strong political resistance. In December 2011, the National Assembly came out against the reform, claiming that it was premature and not supported by firm data. In response, the Ministry of Finance presented a brief on fuel subsidies, supporting it with data on the explosive growth of the subsidies and comparing their costs with capital expenditure (Okonjo-Iweala, 2011). However, trade unions opposed it, echoing a widely held view that the proceeds from subsidy removal would most likely go to wasteful government spending rather than projects to benefit ordinary Nigerians (Okigbo and Enekebe, 2011). State governors who had generally supported the reform earlier became silent. In the meantime, the sudden increase in the gasoline price on January 1 came as a surprise and set off widespread protests across the country. On January 9, two large union federations launched a national strike which resulted in widespread violence and many deaths. On January 15, the President announced that the fuel price increase would be partly reversed and the new maximum retail price for gasoline would be lowered again to NGN 97 per liter. After this reform reversal, the unions called off their strike.

[1]/ This box is based on IMF (2013), "Case Studies on Energy Subsidy Reform: Lessons and Implications".

9. The second attempt towards fuel subsidy reform was in 2016. In May 2016, the Nigerian government raised the petrol price from NGN 86.5 to NGN 145 per liter (66 percent increase) (Gaffey, 2016). At that time, Nigeria was experiencing a severe fuel shortage, with consumers queuing for hours outside gas stations and often paying way over the new price for black-market products.[7] Due to the fuel shortage, the political resistance to the fuel price increase was relatively less than in 2012.[8] However, the labor unions that went on strike in 2012 still opposed the reform. After that, as the international crude oil price rebounded, the fuel subsidy reemerged.

10. The crash in global oil prices in 2020 gave Nigeria another opportunity to reform, but as global oil prices rebounded recently, implicit fuel subsidy reemerged as before. The Nigerian government had capped the regulatory pump price of PMS at NGN 145 per liter since 2016, but it lowered the pump price to NGN 130 in March 2020, and again to NGN 108 in May 2020, due to the falling global oil price (Gupte, 2020). In June 2020, eventually, the government removed the price cap for PMS. However, after that, as global oil prices rebounded, the government readjusted the pump price to NGN 167, but it is far below the imported (market) price of NGN 233, which leads to large implicit fuel subsidy since January 2021. This fuel subsidy has taken up considerable (explicit or implicit) budget costs, constituting inefficient use of resources that could have been spent more effectively on pro-poor interventions in the economy. From the past experiences, the fear of political resistance for large price increase—coupled with widespread

[7] In 2016, Nigeria, even if it was the Africa's biggest oil producer, was unable to fully meet demand due to several factors, such as the attacks on oil pipelines in the Niger Delta and the shutdown of some facilities (Gaffey, 2016).

[8] Paying more than NGN 86.5 per liter has been a reality for most Nigerians as the subsidized price has rarely been enforced outside Abuja and Lagos at that time, and except unions, some Nigerians were willing to accept a price increase if the subsidy removal was a necessary step towards relieving the fuel shortage (Gaffey, 2016).

corruption and pressure from interested groups—has made the government hesitant to reform this untargeted subsidy.

11. Why have reform attempts failed in Nigeria? Lessons from the past reform experiences and empirical studies present implications for successful reform strategy. From the past experiences, the main reasons for the failure of subsidy reform in Nigeria could be illustrated as follows: (i) a lack of well-designed "communication campaign"; (ii) the public unawareness of the fact that the vast majority of the subsidy goes to better-off Nigerians; (iii) the widespread public perception that the proceeds from subsidy removal may not be used for the general population. These lessons are elaborated below.

- **The authorities need to conduct a well-designed "communication campaign", which is crucial to any reform success.** Empirical studies have also shown that "communication" is a key part of successful reforms (Beaton, et. al., 2013; Inchauste and Victor, 2017; IMF, 2013)—the government that have made clear the reasons for reforms, compensate those worst affected, and ensured that the benefits are widely shared have tended to be more successful (Kojima, 2016; Rentschler and Bazilian, 2017). While the Nigerian government campaigned for subsidy removal at end-2011 and mid-2016, the issue remained highly controversial. The backlash had been predicted, but the communication campaign lasted for a short period of time and there was no broad popular consultation. The Ministry of Finance produced a short brief to support its proposal, but this was issued several months later, and there was no comprehensive report to convince the public (IMF, 2013). There was also a lack of building a broad consensus on the reform even among all tiers of governments and institutions (i.e., federal, state and local government, CBN, National Assembly and NNPC).

- **The campaign should include information on the negative impact of fuel subsidy and the benefits from its removal and compensating measures for the poor.** Empirical study has also confirmed, for example in the case of India power tariff reforms, that when consumers were aware of the negative impacts of energy subsidies, they had a more positive attitude towards reform (Aklin, et. al., 2014). The government should strengthen campaign highlighting that subsidy is "regressive" and its removal improves income inequality and has an overall positive effect if accompanied by adequate compensatory measures.

- **The government needs to establish credibility that the proceeds from the subsidy removal will be used for the general population.** Subsidy mechanisms are notoriously prone to corruption and smuggling, which creates strong opposition to the reform (Inchauste, et. al., 2018; Coxhead and Grainger, 2018). However, the government credibility appears to influence people's openness to subsidy reforms (Moerenhout, et. al., 2017; Inchauste and Victor, 2017), which is linked to a perception of the government's ability to implement reforms and redistribute savings from reforms (Beaton, et. al., 2013; Bridel and Lontoh, 2014; Scobie, 2018). Some have suggested that there is a trust deficit in Nigeria (Ogbu, 2012), particularly in light of the high perception of corruption, with lots of reform opponents such as labor unions and civil right groups highlighting the inability of government to protect the poor (Soile and Mu, 2015; Bashir, 2013; Nwachukwu, et. al., 2013; Akov, 2015). Many look at the current subsidies, even if

they benefit the better-off more, as assistance that will be taken away with large uncertainties as to how the compensatory measures will work. As the 2012 experience, which included a well-designed social assistance program, shows bridging the credibility gap is as important as having a well-designed social assistance program. Empirical evidence also shows that people who believe the government is less corrupt or has the capacity to implement compensation programs appear less opposed to reform (McCulloch, 2021, Okonjo-Iweala and Osafo-Kwaako, 2007; Bashir, 2013; Akov, 2015).

12. The long-awaited Petroleum Industry Act (PIA) was enacted into law in August 2021, which elevated the expectation of deregulation of downstream sector. On August 16, 2021, President Buhari signed the Petroleum Industry Act (PIA) into law with the aim to improve administration of the oil sector and its investment climate (Appendix 1). Regarding the fuel subsidy removal, the PIA stipulates the "market-based pricing principles for petroleum products", as in the 123(1) and 207 of Table 2. Exceptionally, PMS subsidy can be allowed only for a period not exceeding 6 months, as stipulated in 371(6) of Table 2. The 6-month grace period will end by mid-February 2022.

Table 2. Petroleum Industry Act: Petroleum Pricing Principle

No.	Provisions	Implication
123(1)	(f) Avoid economic distortions and ensure a competitive market for the sale and distribution of petroleum products and natural gas in Nigeria and (g) avoid cross-subsidies among different categories of consumers	Market-based pricing principles for petroleum products
207	Where under section 205 (2) if this Act, the authority regulates the tariffs and prices of a licensee, the authority shall allow the seller to recover reasonably and prudently incurred costs, including a reasonable return on the capital invested in the business.	
371(6)	From the effective date, the Government on behalf of the Federation may request the services of NNPC Limited as supplier of last resort to ensure adequate supply and distribution of Premium Motor Spirit (PMS) for a period not exceeding 6 months. All associated costs shall be for the account of the federation.	PMS subsidy lasting up to 6 months is retained. (This would imply expiration by February 16, 2022).

Sources: Nigeria's Petroleum Industry Act, 2021.

13. However, despite the PIA, the existing fuel subsidies are expected to remain for the time being, pending the outcome of the negotiations with labor unions. Contrary to expectations that the signing of the PIA would automatically commence the deregulation of the downstream sector, especially fuel subsidy removal, the federal government (FGN) said the retail

price of PMS (petrol) will remain at regulated price until a feasible framework is developed.[9] The Ministry of State for Petroleum Resources also confirmed that fuel subsidies will be lifted only after the government agrees with labor unions that they develop a feasible framework to minimize the impact of a market-based pricing policy on the masses. In the Article IV mission (November 2021) of the IMF, the authorities expressed their strong commitment to fully remove fuel subsidies by mid-2022 at the latest. To cushion the impact of higher fuel prices, they are planning to provide temporary monthly cash transfers to vulnerable urban households, and negotiations are ongoing with the labor unions.

D. Nigeria's Conversion Plan to Natural Gas Vehicles as an Alternative

14. As an alternative of the fuel subsidy reform, the Nigerian government (FGN) announced an ambitious conversion plan from petrol- to gas-run vehicles. In December 2020, President Buhari declared the launch of the "National Gas Expansion Program (NGEP)" and "National Autogas Roll-out Initiative", which would help accelerate the conversion from petrol- to gas-run vehicles and the deployment of required infrastructure. After that, early this year, the federal government (FGN) said it would convert one million vehicles from petrol (PMS) to gas (CNG or LNG) by the end of 2021 and aim to convert 40 percent of its fleets within 10 years.[10] To support this financially, the federal government (FGN) and the Central Bank of Nigeria (CBN) decided to introduce NGN 250 billion's intervention fund for the conversion program.

15. The switch to gasoline provides some advantages but has large fiscal costs. Main advantages of natural gas are that it is relatively cheaper than the PMS, and it creates less pollution. However, the conversion plan is costly and has a long implementation period. In the context of Nigeria, according to the Department of Petroleum Resources (DPR), it would cost $400 (or around N164,000)[11] to convert one vehicle from running on petrol to running on either CNG or LNG (Azeez, 2021). Considering Nigeria's per-capita GDP of slightly above $2,000, the cost of $400 per vehicle (mainly for three wheelers) will likely be a sizable fiscal burden. The detailed conversion plans are not yet available, but ballpark estimates are large (Table 3). If we assume converting 8 million public vehicles currently present in Nigeria to gas-powered vehicles, the cost is cumulatively estimated at $3.2 billion (Azeez, 2021). Currently, there are 22 million vehicles in Nigeria (including 14 million private vehicles). If we assume the government gives the incentive for conversion equivalent to the full cost ($400) per vehicle and plans to convert all 22 million vehicles, the cumulative cost will be estimated to increase further to $8.8 billion. Moreover, there will be large additional costs to develop the infrastructure (such as CNG filling stations, storages, and etc.), which might vary dependent on the country-specific infrastructure plans. Thus, if the Nigerian government decides to

[9] Source: The Guardian (2021.8.18), "Despite PIA, FG to retain subsidy, sell petrol at N162".

[10] Source: Reuters (December 2, 2020), "Nigeria launched ambitious plan to convert car fleet to gas".

[11] National Gas Expansion Program (NGEP) manager said the cost was between N190,000 and N250,000, depending on the vehicle (source: Punch (2020.10.16) "Auto-gas: Nigeria moves to tap environmental and cost benefits".

pay support for the conversion and infrastructure, careful consideration should be given to costs relative to the benefits.

Table 3. The Estimated/Illustrative Medium-term Costs of Nigeria's Conversion Plan

Category	Coverage	Calculation	Estimated cumulative costs
Vehicle Conversion costs	(i) **Public vehicles**	8 million vehicles (public vehicles currently present in Nigeria) × $400 (conversion cost per vehicle)	**$3.2 billion**
	(ii) **All vehicles** (public + private)	22 million vehicles (= 8 million public vehicles + 14 million private vehicles) × $400 (conversion cost per vehicle)	**$8.8 billion**
Infrastructure costs	(iii) CNG filling stations, storages, and etc.	Additional costs vary, dependent on the country-specific infrastructure plans. (The detailed plan is not yet available)	

Sources: Azeez, (2021) "DPR: Petrol Price may Increase to N1,000 per liter If Subsidy is Removed", July 19, 2021, and the Department of Petroleum Resources.
Note: The detailed conversion plans are not yet available for now, since the Nigerian government has not yet announced the details. The above estimated costs are just ballpark figure as an example.

16. Cross-country experiences show that successful conversion plans have the following common features. The governments have continuously been implemented in the medium-term perspective (since end-1990s or early-2000s), and they have launched several incentive programs to promote the conversion to natural gas vehicles (NGVs) (i.e., Argentina, China, India, Iran, and etc.). Some countries (like India) have mitigated large fiscal burden for the conversion by gradually removing the existing fuel subsidies at the same time ("subsidy swap"). The details of cross-country experiences of the conversion to NGVs are illustrated in Annex II.

E. Policy Recommendations

17. Nigeria should implement simultaneously both energy reforms—i.e., (i) "the short-term fuel subsidy removal (market-based pricing) with mitigating measures to protect the poor" and (ii) "the medium-term conversion plan from petroleum to natural gas vehicles (NGVs)". These two are not replaceable, but rather, complementary. As discussed in section II, fuel (PMS) subsidy is "regressive" and generates large fiscal burden and distortion of resource allocation. Through eliminating fuel subsidy, the Nigerian government can create fiscal space to protect the poor and prepare for the medium-term conversion plan. Regarding conversion plan to CNG, its costs and benefits should be analyzed, and the plan should be accompanied by the fuel subsidy reform to have fiscal space to implement it.

18. The following policy measures are important. First, with the "Petroleum Industry Act (PIA)" that has the provision of market-based pricing for petrol products should be adhered to with the authorities reaching an agreement with labor unions by early next year. Second, to persuade the

public and unions, a well-designed "communication campaign" needs to be conducted. Third, to cushion the impacts of higher fuel prices, well-targeted cash transfers programs need to be in place in consultation with the World Bank, who is working to strengthen the delivery system through digitalization and integration of various state-level registries. Fourth, building a broad consensus on the reform is also needed among all tiers of governments and public institutions (federal, state, and local government, CBN, National Assembly, NNPC and etc.).

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Appendix I. The Petroleum Industry Act 2021

On 16 August 2021, the Petroleum Industry Act (PIA) was enacted into law, which contains the following 5 chapters, 319 sections and 8 schedules.

Ch.1. Governance and Institutions

- The objective is to ensure good governance and accountability, and create a commercially oriented national petroleum company, and foster a good business environment on petroleum sector.
- Dual regulatory agencies are created: the Nigerian Upstream Regulatory Commission (the "Commission") and the Midstream and Downstream Petroleum Regulatory Authority (the "Authority").
- "NNPC Limited" is to be incorporated within 6 months and replace the NNPC entirely within 18 months. NNPC Limited is operated on a commercial basis without government funding and must publish annual reports and audited accounts. Government owns all shares in NNPC Limited through the Ministry of Finance & Ministry of Petroleum as shareholders while also controlling the selection of its management team. This structure is expected to pave the way for an invitation to the Nigerian public to own shares in the company in the future.

Ch.2. Administration

- The objective is to promote exploitation of petroleum resources for the benefit of Nigerian people and for sustainable development of the industry and to ensure transparency in the administration.
- Avoid economic distortions and ensure a competitive market for the sale and distribution of petroleum products and natural gas in Nigeria and avoid cross-subsidies among different categories of consumers (market-based pricing principle for petroleum products).
- Pricing principle of petrol products: When the authority regulates the tariffs and prices of a licensee, the authority shall allow the seller to recover reasonably and prudently incurred costs, including a reasonable return on the capital invested in the business.

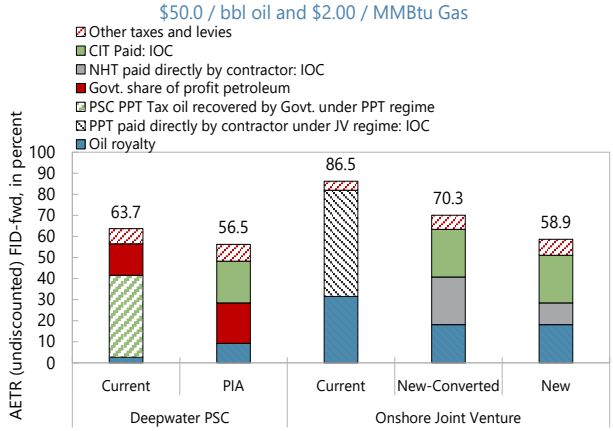
Ch.3. Host community development

- The aim is to foster sustainable prosperity within host communities and harmonious co-existence.
- A company that has been issued with an oil prospecting license or mining lease or an operating company is required to set up a host community development trust fund to support sustainable development within host communities. The company will contribute 3% of its actual operating expenditure in the preceding calendar year in the upstream petroleum operations to the trust fund.

Ch.4. Fiscal framework

- The objective is to establish an adaptable fiscal framework to promote investment in the petroleum industry, given the changing global outlook for the sector.
- The new fiscal terms will provide greater incentives to invest in the oil and gas industry but could reduce the government take from new and converted fields, with the short-term revenue impact dependent on the pace of conversion of existing fields to the new terms (text chart).

- A new royalty combines a base rate with a variable rate linked to oil prices. The Petroleum Profits Tax (PPT) is replaced by the regular CIT at 30% and a new Hydrocarbon tax at rates from nil for offshore production to 15% or 30% for onshore production. This reduces the average effective tax rate for companies in the upstream sector to around 60~70% as opposed to the previous 85% rate.
- The Commission will collect rents, royalties, and production shares as applicable while the Authority will collect the gas flare penalty from midstream operations.
- A Frontier Exploration Fund will be financed through a 30% deduction of profit oil and gas in the production sharing, profit sharing and risk service contracts, which will be administered by NNPC.



Source: IMF staff estimates using FAD FARI model.
Note: The FARI model calculates total government revenue from all fiscal instruments over the life of a petroleum extraction project with illustrative investments reflecting country-specific production and cost structures. The average effective tax rate presents the government revenue as a share of project cashflow.

- Gas flaring penalties will no longer be transferred to the Federation Account and will instead be used for gas infrastructure development or environmental remediation in the host communities.

Ch.5. Miscellaneous provisions

- The PIA repeals about 10 laws including the Associated Gas Reinjection Act; Hydrocarbon Oil Refineries Act; Motor Spirits (Returns) Act; NNPC (Projects) Act; NNPC Act; and PPPRA Act.

Appendix II. Cross-Country Experiences of Conversion to NGVs[1]

1. India's "Delhi Pollution Control Program" and "Subsidy Swap"

In 1999, the Supreme Court of India made its landmark decision to adopt "Delhi's pollution control program", which included converting Delhi's bus fleet to CNG, defining CNG as an approved type of clean fuel, and providing financial incentives to replace existing autorickshaws and taxis with those operating on CNG. This program became the basis for other cities to adopt similar efforts. Also, India has mitigated the large fiscal burden for the conversion by gradually removing the existing fuel subsidies at the same time ("subsidy swap"), which created fiscal space to transfer to clean energy including natural gas and resulted in a shift in public financial resources from petrol to natural gas. As a result, during 2014-2017, India's support to petrol fell by almost three quarters—reflecting a combination of policy reform and lower world oil price—while support for clean energy including natural gas has increased almost six times (IISD, 2019). As the Indian government continues to promote a gas-based economy, highlighted with the "Gas4India" campaign launched by the Ministry of Petroleum and Natural Gas in 2016, its NGV market is continuously growing.

2. Argentina's "Liquid Fuel Substitution Program"

In 1984, Argentina launched the "Liquid Fuels Substitution Program", which aimed to replace diesel with natural gas in public transportation through vehicle conversions to run on the CNG. The program focused on maintaining favorable CNG prices through establishing standards for CNG equipment, filling stations and support for vehicle conversion. Credit lines were also extended for the conversion of the taxi fleet in Buenos Aires, and the funding of three fueling stations in key parts of the capital mitigated the fears of the public about the use of natural gas as a transportation fuel. In Argentina, the price advantage of CNG over diesel or gasoline was the strongest driver for the increase in conversion rate. Argentina's NGV growth spiked in the early 2000s when Argentina faced an economic crisis. However, the price factor was impacted by the country's natural gas supply shortage thus leading to a stagnation in its fleet from 2004. Despite these challenges, Argentina continues to support CNG vehicles, and eventually Argentina tripled its NGV to 1.6 million vehicles during the past 20 years.

3. Iran's Plan to promote NGV by "Iranian Fuel Conservation Organization (IFCO)"

Although Iran is rich in crude oil, the lack of oil refineries forces Iran to refine part of its own crude oil in Europe. When international sanctions banned gasoline sales to Iran, it had to look for alternative sources to meet growing fuel demands. Natural gas provided an easy option as Iran holds one of the world's largest gas reserves. The government first introduced its plan to promote NGVs by establishing the "Iranian Fuel Conservation Organization (IFCO)" in 2000. The IFCO focused on retrofitting existing vehicles for CNG use and constructing CNG refueling stations. In 2006, the Iranian parliament voted to pay the equipment expenditure costs for all CNG stations, triggering a rapid growth in NGVs. Iran's NGV

[1] Sources: CSIS (Singh, K; 2019), "Pathways for Developing a Natural Gas Vehicle Market" and IISD (2019), "Fossil Fuel to Clean Energy Subsidy Swaps: How to Pay for an Energy Revolution".

policies were a success; the number of NGVs grew from almost zero to 3.5 million in just over a decade, making Iran a global leader of NGVs. Despite the shortage of refueling stations, NGVs are likely to remain popular in Iran as CNG is significantly cheaper than gasoline. Moreover, Iran's "Sixth Country Development Plan" mandates domestic manufacturers to have 50 percent of their annual vehicles produced be CNG compatible, ensuring the availability of NGVs for willing consumers.

4. China's "Clean Vehicle Action"/ "Five-year Plan for Natural Gas Development"

With the world's largest NGV fleet at 6 million NGVs—approximately 3.7 percent of the country's total vehicles—China has supported natural gas in transportation to curb air pollution. In 1999, China introduced the "Clean Vehicles Action" for 12 demonstration cities, which established the percentage targets for alternative fuels including CNG in bus and taxi fleets and provided R&D funding for industry and financial subsidies for buyers. Until 2015, the government had regulated the CNG prices to be lower than gasoline. Central and local governments have established development plans to promote NGVs in public transportation, supported refueling infrastructure construction, provided financial support through subsidies and tax exemptions, and relaxed restrictions on CNG conversions. The growth of the NGV market has also been indirectly supported by China's efforts in developing natural gas infrastructure, such as "West to East Gas Pipeline Projects". These pipelines have ensured that provinces that lack natural gas resources are able to have access to it. However, remote areas are still far from this gas grid, and there are safety concerns with CNG vehicles in dense cities (some cities have strict mandates against CNG conversions). Also, to tackle pollution from diesel, LNG was introduced for heavy-duty vehicles in 2012. In its 13th "Five-Year Plan for Natural Gas Development", China set a target of 10 million natural gas vehicles, doubling its 2016 NGV population, and 12,000 refueling stations for vehicles by 2020.

NIGERIA'S INFLATION PERSISTENCE—CAUSES AND POLICY RESPONSE[1]

1. The first objective of this paper is to investigate Nigeria's inflation performance over the past 50 years. The historical behavior of Nigeria's long-term inflation has not been very different from those of emerging market and developing economies (EMDEs)—and characterized by two secular waves: a period of great inflation (from mid-1980s to mid-1990s) and that of great disinflation (from mid-1990s to present). However, Nigeria's inflation has been higher and more persistent than EMDE and Sub-Saharan Africa (SSA) peers.

2. In Nigeria's policy and academic circles, a popular view has been to attribute this higher inflation to country-specific idiosyncrasies. Commonly cited factors include Nigeria's long-standing structural impediments (e.g., poor infrastructure), which cause supply-side bottlenecks[2]. Using a panel regression of 130 countries, we investigate this. Our empirical findings suggest that the main driver of Nigeria's long-run inflation has been monetary and exchange rate factors, and thus not really unique. It also shows that Nigeria's relatively weak performance during the great disinflation period is partly explained by its slow progress in establishing a credible monetary policy operational framework.

3. The second objective of this paper is to examine the surge in inflation experienced since the onset of the COVID-19 pandemic, which peaked in March 2021. Using monthly time series data for 1995M5-2021M7 for Nigeria, we ran an Auto Regressive Distributive Lag (ARDL) model to investigate the dynamic short-term drivers of inflation during the pandemic. Our analysis shows that the inflation surge experienced in recent years has been largely driven by transitory factors. It also shows that the impact of future exchange rate adjustment is likely to be muted given the passthrough already occurred through the bureau de charge (BDC) and parallel market exchange rates.

A. Nigeria's Inflation Persistence: A Historical Examination

Stylized Fact

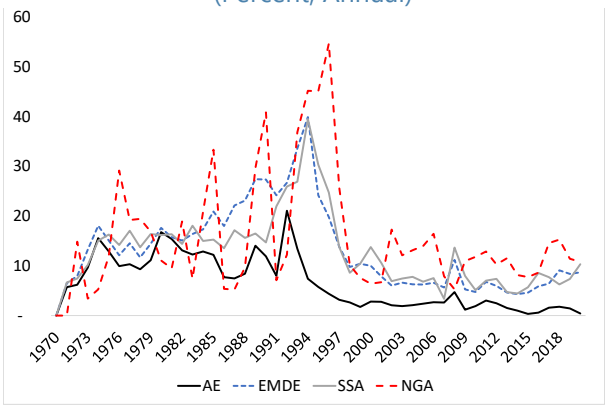
4. Nigeria's historical inflation has been higher than its peers (Figure 1 and 2). Its long-term average rate of CPI inflation (1971-2020) was 16 percent, which is higher than both SSA (13 percent) and EMDE (13.6 percent) averages. Compared to SSA (7.2 percent) and EMDE (6.2 percent) median, the difference is more pronounced. Two possible explanations come to one's mind upon data investigation (Figures 3 and 4). First, Nigeria's broad money (M3) growth has been persistently high--with its 50-year average registering 21.2 percent. This is 1.5 and 1.3 times more than EMDE

[1] Prepared by Jack Ree (AFR).

[2] CBN's MPC has consistently reiterated this point lately. One such example can be found in MPC communique for November 20 meeting with the following citation: "The continued increase … inflation was attributed to the persistence of insecurity… as well as lingering structural deficiencies …such as poor road networks, unstable power supply and a host of other infrastructural deficiencies."

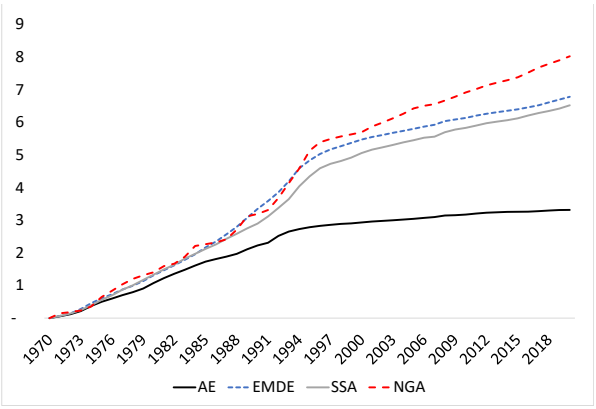
(18.5 percent) and SSA (16.7 percent) averages respectively. Likewise, its exchange rate underwent more persistent depreciation. Nigeria's long-term rate of currency deprecation (on average 10.6 percent annually since 1973) was 1.5 times higher than both EMDE (7.2 percent) and SSA (7 percent). Given limited availability of long-term data, it is difficult to estimate the exact reasons. However, the historical behavior of NEER shows that Nigeria's NEER depreciation episodes tended to be more abrupt and disorderly compared with EMDE and SSA peers, where exchange rate adjustments have been far more continuous and smoother (Figure 4). It would thus not be implausible that the more reactive and disruptive exchange rate adjustment tends to be, the larger the risk of inflation-depreciation spiral would become—because expectations are unhinged, and confidence undermined more.

Figure 1. Inflation, 1970–2018
(Percent, Annual)



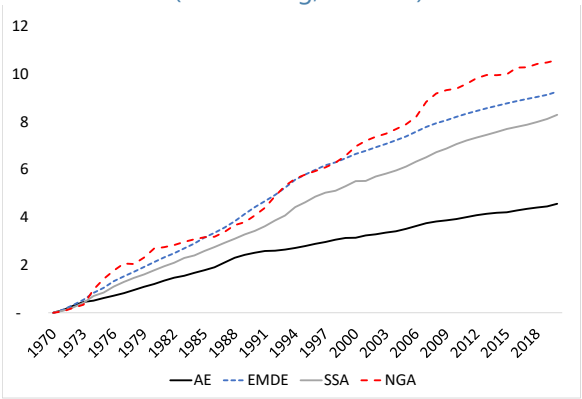
Source: WEO, WDI, World Bank (2019), IMF staff estimates.

Figure 2. CPI, 1970-2018
(Natural log, 1970=0)



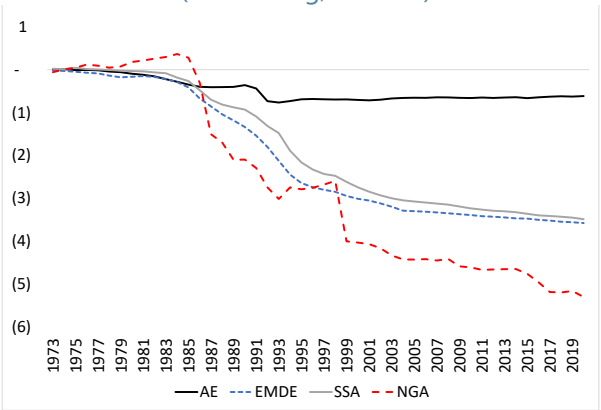
Source: WEO, WDI, World Bank (2019), IMF staff estimates. .

Figure 3. Broad Money, 1970–2018
(Natural log, 1970=0)



Source: WEO, WDI, World Bank (2019), IMF staff estimates.

Figure 4. NEER, 1973–2019
(Natural log, 1970=0)

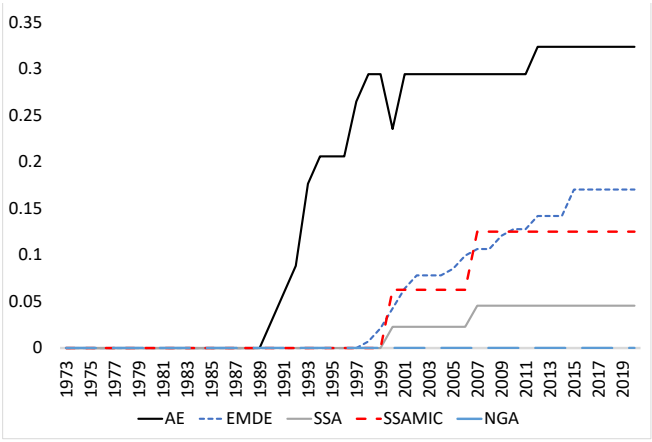


Source: WEO, WDI, World Bank (2019), IMF staff estimates.

5. Nigeria's historical inflation is characterized by two distinctive waves.

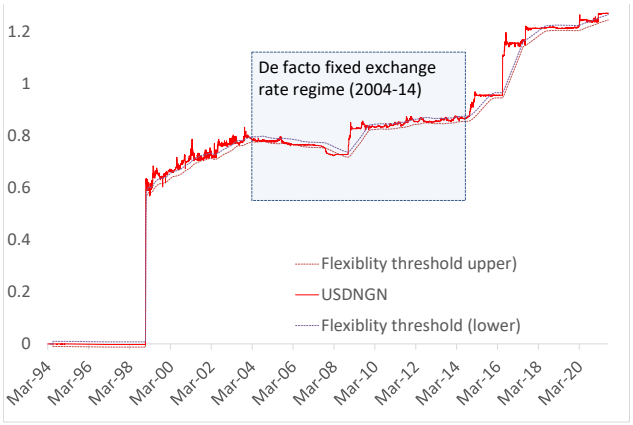
- ***Great inflation (1984-95):*** During this period, Nigeria's inflation underwent significant acceleration, almost doubling (to average 27 percent) from what had already been a double-digit spell (14.5 percent during 1971-83). The large and prolonged inflation pickup, of course, was not only Nigeria's problem. EMDE's average inflation also rose from 14.9 percent in 1971-83 to 25.4 percent in 1984-95.

Figure 5. Inflation Targeting, 1973-2019
(Proportion, Percent)



Source: IMF AREAER; Caceres, Carriere-Swallow, and Gruss (2016); World Bank (2019), IMF staff estimates.

Figure 6. Exchange Rate, 1994/3/21–2020/8/21 1/
(Natural log, 1994 March 21=100)



Source: Bloomberg, IMF staff estimates.
1/ Threshold upper (lower) bound is calculated by adding (subtracting) 1 percent to (from) 365D moving average of USDNGN (log). The de facto exchange rate regime follows Ilzetzki, Reinhart, Rogoff (2017); and World Bank (2019).

- ***Great disinflation (1996-2020).*** Then came a reversal with Nigeria's inflation receding to average 11.6 percent during this period. However, Nigeria's disinflation performance lagged behind EMDEs, whose average inflation fell from 25.4 percent in 1984-95 to 7.8 percent in 1996-2020. SSA's average inflation rose less than Nigeria during 1984-95; so, it also managed to land to single digits (9.5 percent) during 1996-2020, although its inflation dampening was pretty similar to that of Nigeria.

  - After the Asian currency crisis, EMDEs began to adopt inflation targeting (IT) as part of their ambitious monetary disinflation programs (Figure 5). As the result, the proportion of IT countries in the EMDE and SSA middle income country (SSAMIC) groups rose from zero in early 1990s to 17 and 12 percent respectively. Existing literature[3] establishes fairly robust evidence that IT has helped disinflation across various country groupings. Instead of an IT, Nigeria has pursued a monetary aggregate targeting (MT). However, Nigeria's MT has not established strong credibility as a rules-based macroeconomic stabilization mechanism[4].

  - Nigeria also utilized an exchange rate anchoring strategy. More specifically, Nigeria's exchange rate regime shifted from a flexible to a fixed one in 2004 (Figure 6)[5]. It may well have helped stabilize inflation expectations, which had kept drifting[6]. However, this regime

[3] See Bernanke and Mishkin (1997), Debelle, Masson, Savastano, and Sharma (1998), and Svensson (1997) among others.

[4] The reason behind the weak performance of Nigeria's MT was twofold. First, it was operated in a procyclical fashion with exchange rate stabilization imperatives dominating those for keeping inflation low and stable. Second, the operational framework itself lacked core elements (e.g., transparent communication and built-in correction mechanism for deviation from the target) to underpin credibility. For assessment of the performance of Nigeria's monetary policy, see Ree (2020).

[5] See Ilzetzki, Reinhart, and Rogoff (2017) and World Bank (2019) for historical shifts in de facto exchange rate regimes.

[6] Gosh, Gulde, Ostry, and Worf (1997) established causal relationship between exchange rate pegs and lower inflation.

change unraveled itself in 2015, as an oil price crash pushed naira into a spell of large, repeated depreciation.

6. Can we quantify the relative importance of likely drivers of Nigeria's long-term inflation—through various economic cycles? To address this, we constructed a large cross country panel data set, which includes all 130 EMDEs included in the IMF's World Economic Outlook (WEO) database for a time span of 50 years (1970-2020)[7].

- ***Modeling choice:*** We adopted a fixed effect panel regression model as our model of choice (see equation (1)).[8] While being basic, the model proves to serve our purpose well—with its large sample size yielding a good model fit (without having to resort to lagged dependent variables or co-integrating relationships) and the model's generic characteristics enabling flexible inclusion of various country-specific factors. As is well-known, cross-sectional fixed effects take care of omitted variable biases. Moreover, the large size of cross-sectional observations ensures nice asymptotic properties, including, of low frequency variables (e.g., exchange rate regime dummy).

- ***Equation specification:*** Our model can be described as follows:

$$dlog(CPI_{i,t}) = c_i + b(1)\cdot dlog(M3_{i,t}) + b(2)\cdot dlog(M3_{i,t})\cdot dum_{break} + b(3)\cdot dlog(M3_{i,t})\cdot dlog(NEER_{i,t}) + b(4)\cdot dlog(NEER_{i,t}) + b(5)\cdot dlog(NEER_{i,t})\cdot dum_{break} + b(6)\cdot dlog(DebtGDP_{i,t}) + b(7)\cdot dlog(Energynet_{i,t}) + b(8)\cdot Foodnet_{i,t} + b(9)\cdot d(TradeOpen_{i,t}) + b(10)\cdot IT_{i,t} + b(11)\cdot dlog(NEER_{i,t})\cdot XRregime_{i,t} + b(12)\cdot dlog(CPagriculture_{i,t}) + u_{i,t} \quad (1)$$

  CPI, M3, Dum_{break}, NEER, DebtGdp, Energynet, Foodnet, Tradeopen, IT, XRregime, CPagriculture denote consumer price index, broad money, structural beak dummy (1 if t>93, 0 otherwise) net effective exchange rate index, public debt-to-GDP ratio, net energy import-to-GDP ratio, net food import-to-GDP ratio, trade-to-GDP ratio, inflation targeting dummy (1=yes, 0=no), de facto exchange rate regime dummy (1=fixed, 0=flexible), and commodity price index for agricultural products. Scalar $b(j)$ denotes regression coefficient for j[th] non-constant regressor, u statistical disturbance, scalar c_i a country fixed effect.

- ***Data:*** See Table 1 for data description.[9]

[7] Our rolling window analysis indicates that the relationship between CPI, M3 and NEER may have changed since mid-1990s. To control for this, we introduced a structural beak dummy (1 if t>93, 0 otherwise) to capture changes in regression coefficients of M3 and NEER over time.

[8] Alternative choice could have been a panel auto regressive distributive lag (ARDL) model (Pesaran, Shin, and Smith, 1999), which enables dynamic specification (i.e., use of lagged dependent variable) in a data setting with large time observation, which is not suitable for Arellano and Bond (1991)'s dynamic panel GMM approach. While we ran panel ARDL model, we do not report the outcome—which is substantially less informative due to tight limitations on feasible traits of explanatory variables (e.g., IT or exchange rate regime dummy variables—or any country dummy variable—give rise to singularity in an ARDL model).

[9] Our data borrows extensively from the data published online by the authors of World Bank (2019). Time series splicing techniques (e.g., backward extrapolation) were used to match them with more recent data.

Key Findings

7. Nigeria's historical inflation dynamics were mainly driven by monetary and exchange rate factors, in line with the trends of EMDE and SSA groups.

- Unsurprisingly, the main force behind Nigeria's history of inflation persistence is monetary expansion (Figure 7). Our regression suggests that about one half of Nigeria's long-term average inflation can be attributed to M3. Available historical data shows that M3 growth was largely driven by foreign exchange inflows or fiscal financing[10]—with limited imprints made on credit deepening[11].

- NEER accounts for about a fourth of it. NEER depreciated 58 percent of the time for the whole sample. During these times, NEER adjustments accounted for roughly one half of annual CPI inflation (Figure 8). However, this result should be interpreted with caution as NEER is also affected by CPI—which may lead to endogeneity bias[12]. Such bias could cause overestimation of the NEER effect.

- About a quarter of historical inflation is explained by deterministic drift—which contains a Nigeria-specific fixed effect, which may be interpreted as an unidentifiable structural factor. However, identifiable structural factors have played limited roles with the combined net contribution of all such variables during 1971-2020 estimated close to zero. Our estimation also suggests that Nigeria's non-adoption of an inflation targeting (IT), explains the relatively limited roles played by the identifiable structural factors: as coefficients for such factors, except the IT, are very small[13].

[10] Available historical data point to large shifts in drivers of monetary growth over time. For example, during 2001-8, M3 growth was almost entirely driven by NFA accumulation. However, the tendency turned to the opposite since 2009--i.e., almost fully led by NDA accumulation, which had multiple engines: having been driven 73 percent by net credit to government, 36 percent by private sector credit, 23 percent by credit to other financial institutions, with the others (-31 percent) providing offsets.

[11] Nigeria's private sector credit-to-GDP ratio (12 percent) is less than ½ of SSA average (26 percent) and ¼ of EMDE average (45 percent).

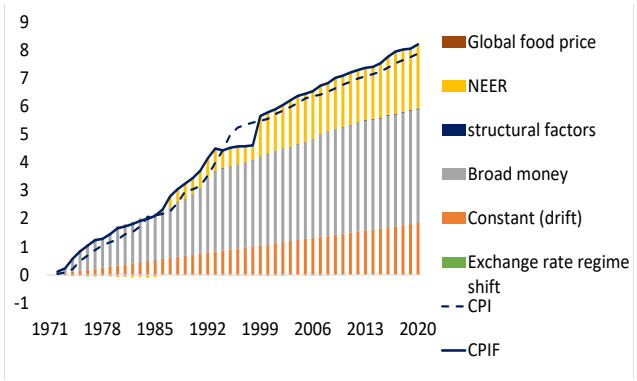
[12] Our regression model does not rule out endogeneity problems (i.e., changes in dependent variable feeding back to independent variables) particularly for M3 and NEER. However, we use (1) as our baseline model as our focus is not on regression coefficient itself but decomposition of historical inflation into various underlying factors—which are associated with inflation (including through feedback). GMM or TSLS also does not work for this large cross section-large sample period set up. However, an alternative specification using lagged variables of M3 and NEER hint that our baseline results are quite robust.

[13] The estimated coefficient of IT dummy is -0.026. It means that an adoption of an IT permanently lowers the inflation rate (i.e., log difference of annual CPI) by 2.6 percentage points. For example, Ghana's average inflation rate was reduced from 28.5 percent (1971-2007) to 10.9 percent (2008-20) since adopting an IT. Had it not introduced an IT, its 2008-20 average inflation rate would have been 13.5 percent according to our regression model.

8. Nigeria's two secular waves[14] of inflation are largely explained by NEER shocks and their unwinding (Figure 9).

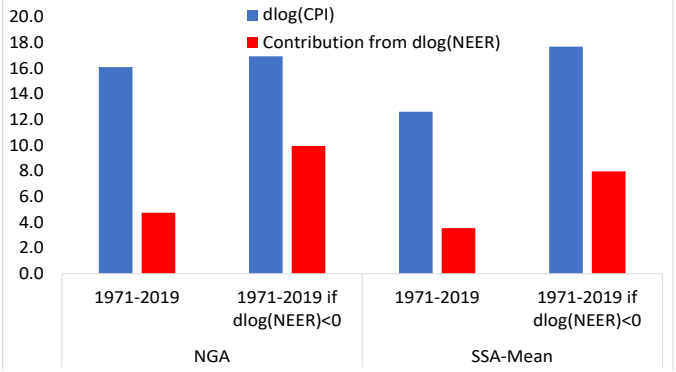
- ***Great inflation (1984-99):*** During this period, average inflation rose by 9 percentage point. Most of this is attributed to NEER depreciation (+113 percent), which was partially offset by monetary tightening shocks (-30 percent). Unidentified inflationary pressures also added to the rise in inflation (+10 percent).

Figure 7. CPI Drivers, 1971–2020
(Natural log, 1971=0)



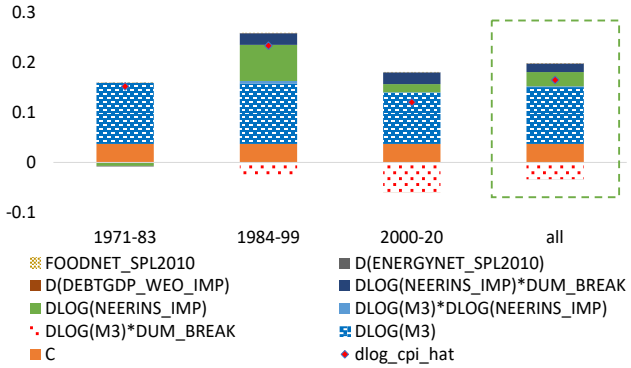
Source: IMF staff estimates based on regression (1).

Figure 8. NEER Impact, 1971-2019
(log difference)



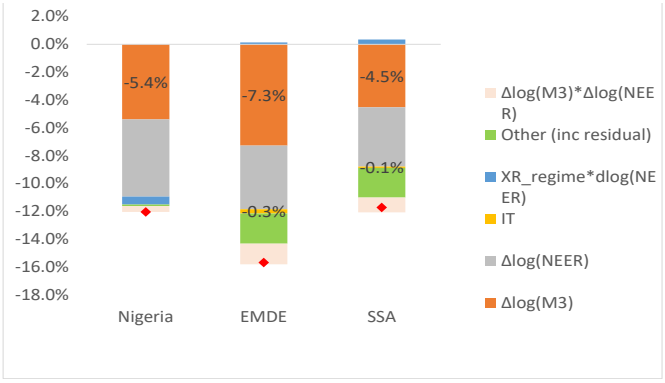
Source: Source: IMF staff estimates based on regression (1).

Figure 9. CPI Inflation, 1971–2020 [1/]
(percent , period average)



Source: IMF staff estimates based on regression (1).
1/ Contributions of various regressors on CPI inflation.

Figure 10. Disinflation Drivers, 2000–2020 [1/]
(percent, period average)



Source: IMF staff estimates based on regression (1).
1/ Contributions to change in period average inflation between great inflation (1984-99) and great disinflation (2000-20) periods

9. *Great disinflation (2000-2020):* Less hawkish use of monetary tightening seems to be the key reason behind Nigeria's weaker disinflation performance during this period. Non-adoption of an IT[15] was also a missed opportunity (Figure 10).

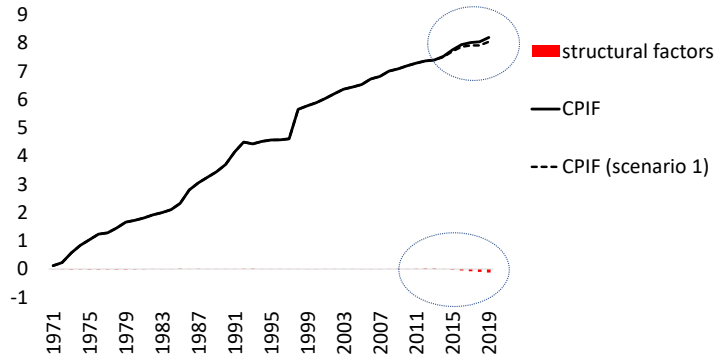
[14] The period breakdown for these two episodes is a bit different from the description in ¶59 because we shifted the starting point of great disinflation to 2020 when the path of actual and forecasted inflation (cumulative) cross. The adjustment aims to maximize the power that the empirical model explains the historical inflation and disinflation episodes.

[15] Instead of an IT, Nigeria has adopted an MT. But this cannot be deemed to have met a standard set by international best practices (see ¶18).

- During this period Nigeria's inflation declined from 23.5 percent (1984-99, period average) to 11.4 percent (period average). The largest contributor to disinflation was NEER (50 percent)[16]. In efforts to restrain inflation, the authorities initially relied on exchange rate anchoring—as well as M3 tightening (contributing 45 percent).

- However, exchange rate anchoring strategy was abandoned in 2014 in the face of heightened balance of payment stresses—and with protracted reactiveness causing cascading exchange rate adjustments. A what-if exercise shows that if NGA were—hypothetically—to have adopted an IT in 2015, it could have reduced its average inflation in the last decade by 1.5 percentage points (Figure 11).

Figure 11. CPI Scenario, 1971–2019 1/
(Natural log, 1971=0)



Source: IMF staff estimates based on regression (1).
1/ Counterfactual Scenario 1 assumes that Nigeria adopts IT in 2015.

- Nigeria's disinflation performance (-12 percentage points) was comparable to SSA (-11.9 percent) but weaker than EMDE (-15.4 percentage points) during this period (Figure 10). This relatively weaker outcome can be attributed to less contribution from monetary tightening (2 percentage points less than EMDE) and from IT (30 basis points less than EMDE).

B. Recent Inflation: A Look Into the Pandemic Period

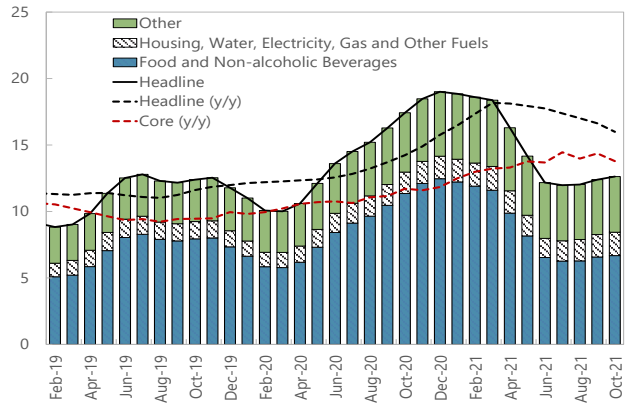
10. During this pandemic, Nigeria experienced a surge in inflation led by increases in food prices (Figure 12). A comparison of price levels between now and the onset of this crisis shows that Nigeria's pandemic period inflation has been more persistent than peers (Figure 13). In fact, Nigeria's inflation was already picking up noticeably in H2 2019 (Figure 12)—when Nigeria closed its land borders (August 2019)[17]. Since these borders have been major trade routes for rice, Nigeria's main staple grain, their closure resulted in a structural increase in food price inflation (Figure 14). Another supply side shock emanated from 2020 October flood, whose effect was concentrated in Kebbi—the largest rice producing state. While difficult to quantify, the ensuing reduction in crop yield is likely to have aggravated food price inflation too. The COVID-19 shocks came against this backdrop. As elsewhere in the world, COVID-19 resulted in both supply chain disruption and exchange rate deprecation. In addition, M2 growth rate also pick up since October 2019 (Figure 15)

[16] This can be deemed principally as autonomous with naira's freefall during the previous episode kept petering out during this period.

[17] The aim was mainly to rein in re-import of offshore agricultural products (mainly rice) especially from Benin. The informal nature of these trade makes it difficult to precisely assess its impact, but the drastic decline in rice imports by Benin thereafter suggest that border closure was largely effective.

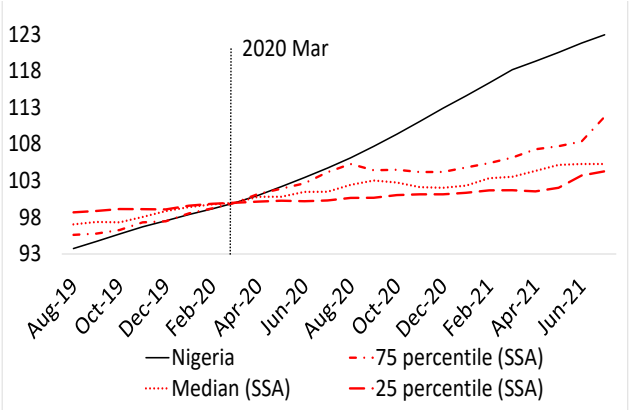
due to CBN's new open market operation (OMO) policy[18]—which could have also added some impulse to inflation.

Figure 12. CPI Inflation
m/m annualized 3-m moving average, seasonally adjusted, in percent)



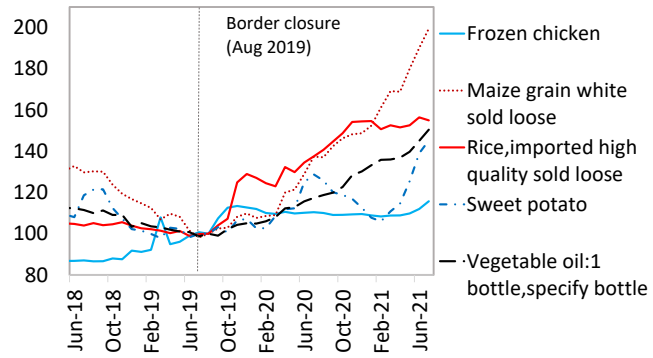
Source: NBS, IMF staff estimates.

Figure 13. CPI
(2020 March=100)



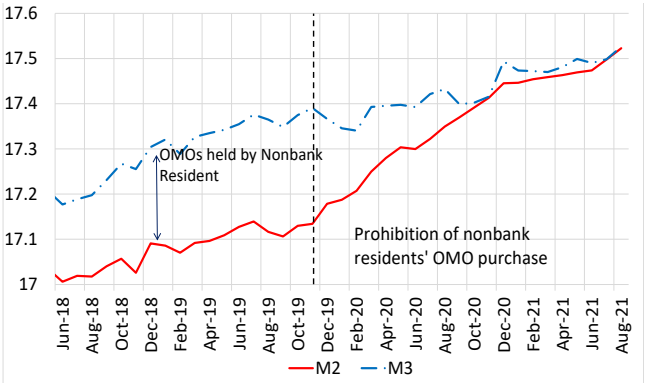
Source: Haver, IMF staff estimates.

Figure 14. Selected Food Price
(Naira/kg, 2018 June=100)



Source: NBS, IMF staff estimates.

Figure 15. M2 and M3
(Natural log)



Source: CBN.

11. How significant has each of these factors been? To answer this, we conducted a counterfactual scenario analysis based on a monthly time series model for Nigeria's CPI determination:

- ***Step 1:*** An ARDL model of CPI for 1995M5-2021M7 was estimated using an optimal lag section algorithm, which minimizes Akaike Information Criteria[19]. The model is parsimonious. It uses M2[20], bureau de charge (BDC) exchange rate ($EXRATE\_BDC$), and exchange rate spread. Considering its longer time series, and close correlation with the latter, we use BDC rate as the proxy for parallel market exchange rates. The exchange rate spread (BDC rate divided by CBN

[18] See Ree (2020) for details.

[19] The Akaike information criterion (AIC) is an estimator of prediction error and thereby relative quality of statistical models for a given set of data.

[20] Our model uses M2, rather than M3, because of its longer time series and closer cointegrating relationship with CPI.

rate[21] ($EXRATE\_CBN$)) is used to capture CBN's resort to *de facto* FX rationing[22] to pace exchange rate adjustment (with more stringent rationing resulting in larger spread). The estimated model has very high explanatory power (Adj R2=0.9998) which stems from the highly significant cointegrating relationship among the variables. All coefficient estimates are significant with expected signs.

$$Log(CPI_t) = C + \sum_{j=1}^{k} \beta_j Log(CPI)_{t-j} + \sum_{j=1}^{m} \delta_j Log(M2SA)_{t-j} + \sum_{j=1}^{p} \gamma_j Log(EXRATE\_BDC)_{t-j} + \sum_{j=1}^{q} \theta_j Log(EXRATE\_BDC/EXRATE\_CBN)_{t-j} + \epsilon_t$$

- ***Step 2:*** CPI is simulated based on four scenarios (*, **, ***, ****) on money and exchange rate shocks (Table 1). These scenarios are constructed by using various combination of actual developments (shock) and counterfactual paths (no shock) of M2, BDC rate, and exchange rate spreads.

- ***Step 3:*** CPI (actual) is decomposed using gaps between counterfactual CPIs simulated under these four scenarios. For example, Log(CPI***)-Log(CPI**) is interpreted as exchange rate shock; and Log(CPI)-Log(CPI*) as total inflation shock (Figure 16, left).

Table 1. CPI Simulation Scenarios

	M2SA	BDC rate	Rate spread	Interpretation
*	counterfactual	counterfactual	counterfactual	Without any shock
**	actual	counterfactual	counterfactual	With monetary shock only
***	actual	actual	actual	With both monetary and exchange rate shocks
****	actual	actual	counterfactual	With all shocks and without MCP 1/

1/ This assumes that I&E rate has converged to actual BDC rate since June 2019.

12. The analysis indicates that supply-side factors likely have played a major role in recent inflation dynamics. Exchange rate shock also seems to have played an important part.

- ***Supply shock:*** The scenario analysis shows that 43 percent of the total price shocks (Log(CPISA)-Log(CPI*)) since June 2019 can be attributed to 'other shocks' (Figure 16, left). Other shocks are defined as Log(CPISA)-Log(CPI***). It can be interpreted as the departure of CPI from the path predicted by CPI's historic trend before June 2019 (Log(CPISA)-Log(CPI*)), which is around the time of the border closure—after taking out the portion that is attributable to monetary and exchange rate shocks (Log(CPI***)- Log(CPI*)). Based on our earlier discussion of supply shocks (i.e., COVID-19 shocks, border closure, and flood among others), other shocks may be interpreted primarily as them while other sources of shocks may not be precluded [23]. Closely

[21] It combines I&E rate (whenever available) and official rate (during periods when I&E rates are unavailable).

[22] See 2020 and 2021 Nigeria Article IV Staff Reports.

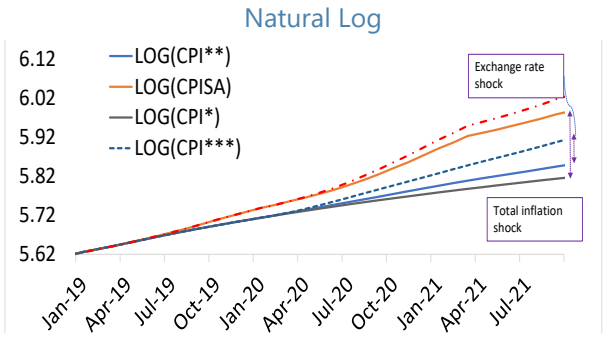
[23] Unfortunately, data gaps make more direct quantification of supply side shocks difficult--particularly for a monthly time series model that we explored.

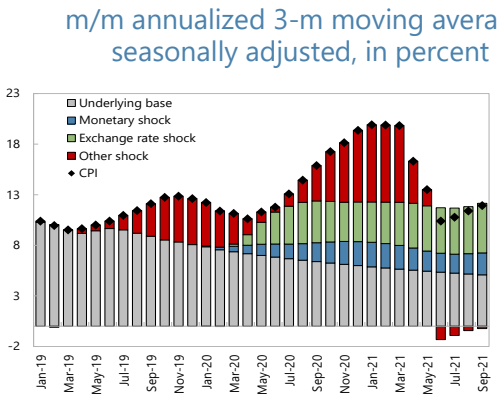
mimicking that of food inflation, the cyclical behavior of these other shocks (Figure 15, right)—in particular their two waves since 2019 (Figure 16, right)—seems to support this interpretation.

- ***Exchange rate shock:*** Exchange rate shock is estimated to have accounted for 38 percent of the overall price shock. However, our analysis suggest that the exchange rate shock has been plateauing. Our estimation also shows that despite the CBN's various attempts to defend I&E rate, which has helped contain exchange rate shock to inflation to a degree, 62 percent of naira's depreciation as reflected in the BDC rate (which is more deprecated than I&E rate) has already been passed through to inflation.

- ***Monetary shock:*** Monetary shock explains the remainder (or 19 percent). How, this estimation needs to be interpreted with caution considering that there were structural changes in M3's composition, which coincided with the accelerated M2 growth[24]. If these changes were to have left overall money-like liquidity of the economy unchanged, the monetary component of the inflation shock would have been overestimated.[25]

Figure 16. Decomposing Inflation: A Scenario Analysis 1/





Source: NBS, Staff estimates.

1/ *, **. *** mean a counterfactual scenario (1) without any shock (money and exchange rate assumed to remain at pre-2019 trend) (2) with monetary shock only; (3) with monetary and exchange rate shocks (4) with all shocks (including other) and without MCP (i.e., without parallel market spread due to rate unification).

13. What does all this mean for the future path of inflation—particularly in the next two years? We present two scenarios (Figure 17).

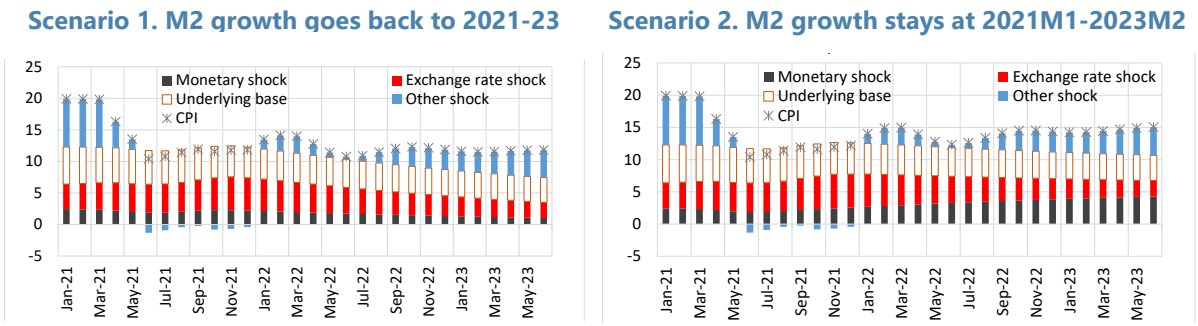
- ***Scenario 1:*** The first one (i.e., back to normal) assumes that the M2 growth rate goes back to the 2018-2019 average level—now that M2's structural convergence to M3 has been completed. Under this scenario, inflation stabilizes at 11-11½ percent range in the medium term.

[24] It is difficult to assess how much of recent M2 acceleration has been passed on to inflation given the structural component shift within M3: from OMOs (which were phased out by CBN) to M2. If OMO bills (commonly called as OMOs) and M2 are nearly perfect substitutes, such a shift would not have caused any change in the overall level of liquidity for economic agents. However, this is unlikely given that OMO holdings barely serve as means of transaction in Nigeria.

[25] In that case, the overestimated amount should be added to 'other shocks'.

- ***Scenario 2:*** The second one (monetary acceleration) assumes that M2 growth rate stays permanently at the recently accelerated levels (2020M1-2021M2 average). Under this scenario, CPI growth rate starts to gradually rerise from mid-2022 reaching a higher steady state (about 15 percent) within the next 24 months. This re-rise is driven by monetary shock—which persists and builds up over time, albeit gradually.

Figure 17. Inflation: Scenario Forecasts [1/]



Source: Haver, Staff estimates.
1/ Inflation drivers are estimated from gaps between various CPI scenarios simulated based on staff's ARDL regression model (1). For forecasts, CPISA is derived from a separate ARIMA model.

C. Conclusion

14. Our analysis shows that Nigeria's pandemic period inflation is likely to have been led by supply-side and exchange rate shocks. Fortunately, both shocks are transitory and appear to have already begun to dissipate. Going forward, the authorities should formulate a well-sequenced and internally consistent set of actions so that the temporary inflation shocks would not lead to dislodged expectations.

- ***Monetary policy:*** There is no need for a premature withdrawal of policy support considering the fragility of the incipient economic recovery and downside risks. Instead, monetary policy response to the recent inflation shocks should focus on strategic communication—to assure the market. The market remains confused about CBN's policy stance and intentions—given the structural shifts within M3, recent discrepancy between M2 and M3 growth rates, and misalignment between policy and market interest rate rates. The market needs to gain clarity on the CBN's current thinking and its plans to rein in inflation before re-establishing confidence on the CBN's inflation target. Now that the path of M2 has fully converged to M3, it is critical that M2 growth rate gets back to normal (e.g., 2018-2019 average). Our scenario analysis shows that continuation of elevated M2 growth will be a policy mistake[26].

[26] Note that the higher CPI path (scenario 2) is predicted to hold whether the identified monetary shock (explaining 19 percent of the overall CPI shock since June 2019) has been overestimated or not. This is because the structural transition (M2 to M3 convergence) which generated large uncertainties on M2-CPI relationship has been completed. Going forward, there is no reason to doubt that the historically established sensitivity of inflation to M2 growth (as estimated by our ARDL model) will indeed take its course.

- ***Exchange rate policy:***, Persistent reactiveness in rate adjustment can only be detrimental, especially when FX stress intensifies[27]. It is also important to recognize that the post-pandemic exchange rate adjustment has taken place including through parallel market rates; with significant part of the ensuing inflation pass-through already made. The predicted unwinding of exchange rate shock provides increasingly larger space for the residual exchange rate adjustment, including by allowing I&E rates to converge towards the parallel market—which is critical to rein in lingering FX stresses. Our model shows that the price impact of the residual exchange rate adjustment[28] will be—while not insignificant—modest enough to be cushioned by offsetting adjustments in other policies.

15. The history of the past semi-century shows that Nigeria's structurally high inflation is in large part attributed to its persistently high monetary growth. Nigeria's relatively weak performance during its great disinflation episode can also be partly explained by its slow progress in establishing a credible monetary policy operational framework. These finding reinforces our view that key priority in the medium term should be a credible and coherent monetary policy operational framework—which focuses on the primacy of price stability[29].

[27] Recent depreciation has brought parallel market spread to over 30 percent; a level that was only witnessed during the 2015M3-2017M4 BOP stress, which eventually required 48 percent depreciation of the official exchange rate. Persistently reactive stance on exchange rate adjustment, under this environment, is likely to undermine, rather than safeguard, confidence.

[28] Our model predicts for example that a 15 percent depreciation in the I&E rate will eventually lift Nigeria's price level by 5.8 percent but its peak impact on annual inflation will be 2.2 percent (see 2021 Nigeria Article IV staff report).

[29] Our panel study shows that CBN can easily achieve its inflation target by adopting an IT now. While Nigeria's less developed financial markets make an immediate adoption of an IT difficult, it can adopt a Flexible Monetary Targeting as a pragmatic alternative and from there gradually move to a full IT (see Ree (2020)).

Table 2. Data Summary

Name	Description	Source	Mean	Max	Min	Std. Dev
DLOG(CPI_SPL)	CPI index. Splicing technique used to handle base year change over time	WEO, World Bank (2019)	0.114341	6.484239	-1.29936	8363
DLOG(M3)	Broad money	WEO, WDI	0.175057	4.837324	-6.59793	6474
DLOG(NEERINS_IMP)	Nominal effective exchange rate. Splicing technique used to handle base year change over time	IMF INS, World Bank (2019)	-0.06155	2.245908	-8.22444	8338
D(DEBTGDP_WEO_IMP)	Public debt-to-GDP ratio. Splicing technique used to handle source data inconsistency	WEO, World Bank (2019)	0.341676	604.3264	-657.919	6375
D(ENERGYNET_SPL2010)	net energy export (percent of GDP). Splicing technique used to handle source data inconsistency	COMTRADE/ WDI, World Bank (2019)	-0.00373	328.8514	-373.438	8015
FOODNET_SPL2010	net food export (percent of GDP). Splicing technique used to handle source data inconsistency	COMTRADE/ WDI, World Bank (2019)	0.385497	156.5032	-92.9879	8371
D(TRADE_OPEN)	Sum of exports and imports of goods and services as percent of GDP	World Bank (2019)	0.360795	341.3552	-303.871	8019
IT	Inflation targetting dummy	World Bank (2019)	0.072157	1	0	8925
DLOG(NEERINS_IMP)*XR_REGIME1	cross effect: exchange rate regime (1=fixed, 0=flexible) and NEER	Ilzetzki, Reinhart, and Rogoff (2017), World Bank (2019)	-0.01117	1.727221	-3.70103	7651
DLOG(CP_AGRICULTURE(	World Bank commodity price index	World Bank (The Pink Sheet)	0.024853	0.492264	-0.21411	9555

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SYNTHESIS OF NIGERIAN LABOR MARKET: PUTTING THE EMPHASIS ON AGRICULTURE[1]

A. Introduction

1. The labor market plays a key role in determining welfare levels in industrial and developing countries and this role is likely to strengthen in Sub Saharan Africa going forward given the demographic bulge taking place over the next 40 years. This chapter tackles this issue in the Nigerian context by using recent household and individual surveys of consumption and labor market characteristics to analyze the welfare of those in the labor force. To glean clear cut messages, the chapter differentiates between different types of workers- those working in agriculture, those who run household enterprises outside of the agricultural sector, wage workers and the unemployed.

2. The notion of unemployment is better understood by distinguishing subsistence living from the conventional notion of unemployment as someone waiting for a better job opportunity. Based on information from the latest household survey**,** only about 3 percent of the labor force are unemployed, defined as someone who does not work at all. Moreover, when we delve into the welfare of the unemployed, as measured by per capita family consumption, we find that they are much better off than agricultural workers because of the insulating role of the families to whom they are attached to.

3. The most disadvantaged in Nigeria's labor force are agricultural workers who count for almost half of the labor force with welfare levels (consumption per capita) at less than 50 percent of those unemployed with a college degree. This is a clear macro-critical issue even if standard macro-economic policies are not well suited to address it. The agricultural sector is also a critical element of the output of the economy, measuring about 26 percent of real GDP, its share below that of employment demonstrating the weak productivity level of the sector. However, in terms of lending, the sector is badly served, with only 5 percent of total private sector credit allocated to the sector, although its share has risen over the past two years benefitting from substantial support from the central bank.

4. Given the large role of agriculture in output and employment, the policy section focuses on ways to raise incomes in this sector. It offers a three-pronged policy package that has been strongly recommended by a variety of institutions such as the World Bank, Food and Agriculture Organization, the Consultative Group on International Agricultural Research, and is outlined in the government's own medium term development plan 2021-25. The policy package comprises

- Improving yields by combining inputs, especially inorganic fertilizer, and improved seeds;

[1] Prepared by Alun Thomas (AFR).

- Reducing the fraction of food that rots through improved storage facilities and the development of a well-functioning warehouse receipt system to help reduce income disparities; and
- Supporting collateral and interregional mobility through completing the land tenure registration system and strengthening the cooperative structure of farms.

5. Of course, following this course of action requires additional financing and given the limited role of the private sector in funding agricultural initiatives, the chapter should be read in tandem with the associated chapter on fuel subsidies that identifies ways for the central government to collect more revenues and with assessments of the Central Bank of Nigeria agricultural finance programs (see below). It should also be read in conjunction with recent work by the World Bank in making the electricity sector more efficient and cost effective that will ultimately support new private funding into this sector and support the recommendation on improved storage.

B. Structure of the Nigerian Labor Force (A Snapshot)

6. The structure of the Nigerian labor force mirrors resource-rich countries in general in Sub Saharan Africa (Figure 1). According to the most recent Nigeria household survey (2018/19), about 45 percent of the labor force is engaged in agriculture and a further 37 percent engaged in household enterprises outside of agriculture. The share of wage employment is a little below that of other resource rich countries at 11 percent and dominated by the public sector and other private services. The unemployment rate is comparable to other low and resource rich countries at about 3-4 percent of the labor force. [2] Of course, this definition of unemployment is the standard ILO definition so that if one hour of work is accomplished, the person is assumed employed. The Nigerian authorities' definition of unemployment is anybody either not working or working for less than 20 hours per week. Under this definition, the unemployment rate obtained from the labor force survey rises to 22 percent, and the unemployed mainly displace those employed in agriculture and household enterprises under the ILO definition (Figure 2). Most wage workers work more than 20 hours per week.

Figure 1. Components of Labor Force
(Based on ILO Definition, in Percent of Total)

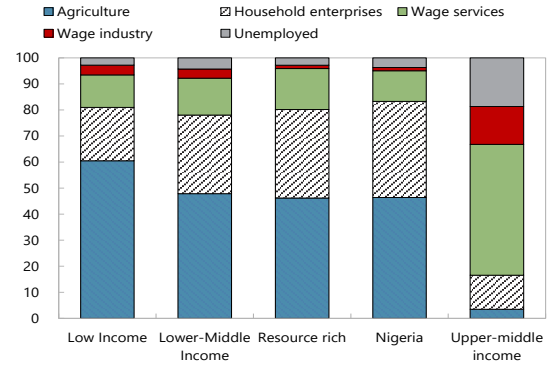
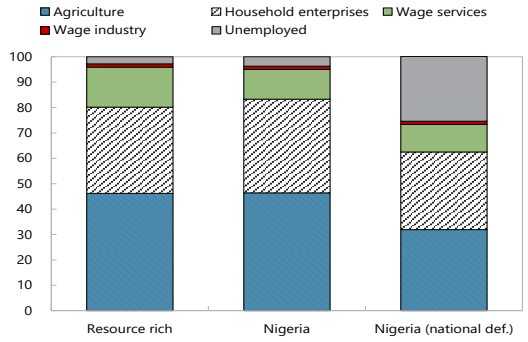


Figure 2. Components of Labor Force
(Compared to National Definition)

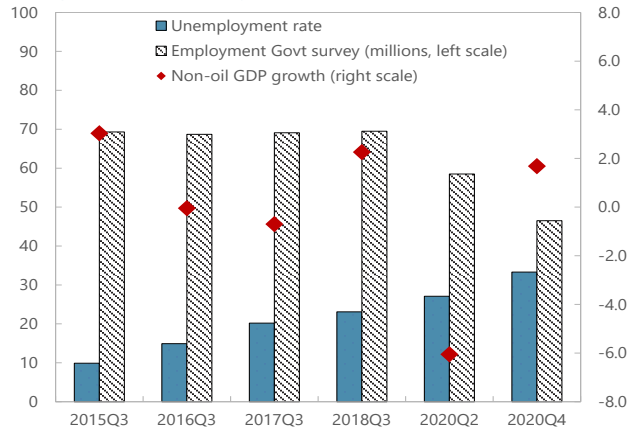


Source: Nigeria 2018/19 household expenditure survey and staff estimates

[2] The continental data is from Fox et al. (2013); the Nigeria data comes direct from the 2018/19 household survey

7. The national authorities provide periodic quarterly estimates of the unemployment rate based on a similar sampling frame. The figure was recorded at 23 percent for Q3 2018 (Figure 3) but it shot up at the start of the COVID-19 pandemic to 30.2 percent based on the average unemployment rate from phone interviews (Q2 2020) and the more traditional face-to-face interviews (Q4 2020). Indeed, the unemployment rate based on the unemployment survey has risen continuously since 2015. Through 2018, this was the result of a continuous increase in the labor force with the employment level holding steady in the upper 60 million jobs range. However, following the COVID-19 pandemic, the employment level crashed, with over 20 million jobs lost. This sharp fall in employment is massive when compared with other SSA countries with available data. While the level of employment fell in Botswana and South Africa, the decline was much less abrupt than for Nigeria (official statistics) and stabilized at end 2020 (Figure 4). For Nigeria, the level of employment kept on falling through the end of the year, even though non-oil GDP growth had bounced back.

Figure 3. Employment and Output Indicators



Source: Haver, NBS

Figure 4. Employment Developments

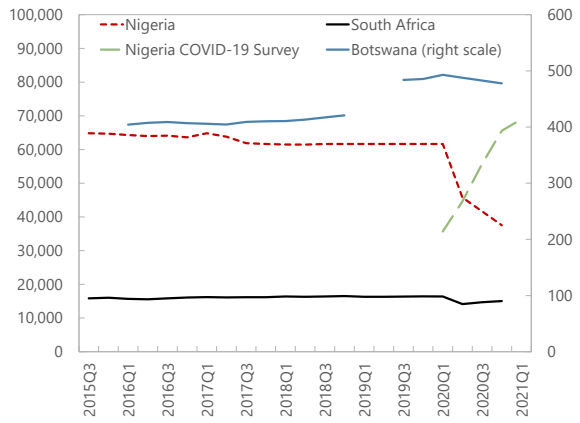
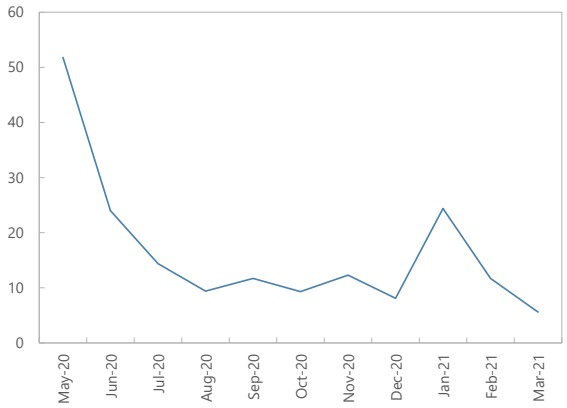


Figure 5. Unemployment Rate, COVID-19 Survey (in percent)



Source: Haver, NBS COVID-19 Phone Survey.

8. More recent high frequency data from the World Bank paints a different picture. Monthly COVID-19 telephone surveys carried out since May 2020 indicate that employment in early 2021 was back at pre-covid employment levels and the unemployment rate was at 5 percent (Figure 5). This survey is based on far less respondents and therefore a comparison with the authorities' quarterly labor force survey is not possible. However, it does suggest that the employment situation has improved considerably since spring 2020.

C. Welfare Differences Across Employment Categories

9. Are the unemployed in Nigeria disadvantaged in terms of economic welfare? This issue is considered by running a population weighted regression of the log of household consumption on various individual and family characteristics such as age, gender, region, urbanization, education level and type of employment-agriculture, household enterprise, private and public wage, and unemployment using the Nigerian 2018/19 household survey. Of course, per capita consumption is a narrow definition of welfare and recent work by Alkire and Foster (2011) have shown that it is important to take a multi-dimensional view of welfare. They broaden the definition of welfare to include self-reported health, availability of health insurance and years of schooling, components that mirror the human development index. We are constrained in our analysis because of data limitations but believe that consumption is a critical (if imperfect) indicator of welfare.

Text Table 1. Nigeria: Family Per Capita Consumption Coefficients

	[1]	[2]
Household size	-0.34 ***	-0.34 ***
Age	0.02 ***	0.03 ***
Gender	0.01 **	0.01 **
Urbanization	0.18 ***	0.18 **
Education		
Primary	0.09 ***	0.09 ***
Lower secondary	0.15 ***	0.15 ***
Upper secondary	0.27 ***	0.26 ***
College	0.46 ***	0.46 ***
Post-graduate	0.82 ***	0.81 ***
Worker type		
Agricultural	-0.09 ***	-0.11 ***
Household enterprise	0.05 ***	0.03 ***
Private sector wage	-0.03 ***	-0.02 *
Public sector wage	0	0.02
Apprentice	-0.05 ***	-0.05 ***
Unemployed (ILO definition)		-0.06 ***
Interaction terms of unemployed (ILO) with		
college educated father	0.02	
High school educated father	-0.1 ***	
Lower seconday school educated father	-0.11	
Primary school educated father	-0.13 ***	
Unemployed (Nigeria definition)		0
R squared	0.54	0.54
Nobs	57627	57627

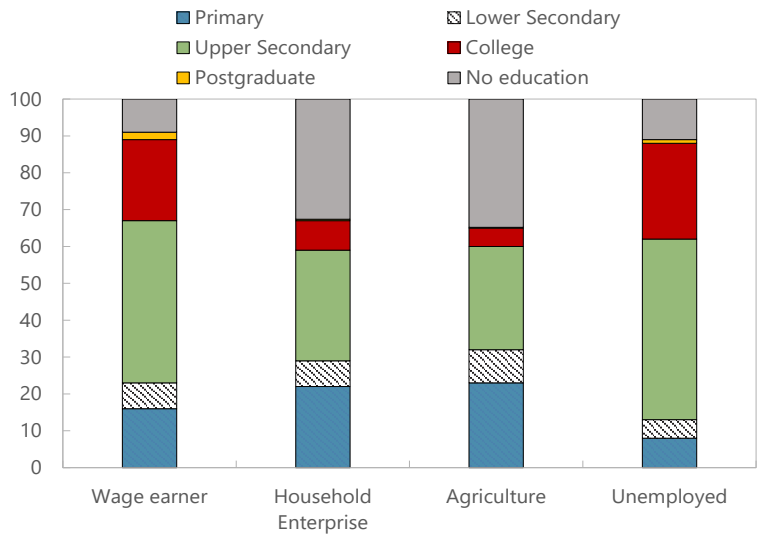
Per capita consumption is defined as household consumption divided by the number of household members. It is expressed in nominal terms. The coefficients relate to individual chaacteristics except for household size and urbanization. The regression is estimated on a sub-sample of those aged between 16 and 66

10. The coefficients on the control variables make intuitive sense. There is a positive age earnings profile that levels out at higher age levels and individual consumption falls as families get bigger (Table 1). These effects correspond to the experience premium and to the difficulty of maintaining welfare in larger families. The education premiums rise as individuals become better

educated so that those with primary education consume 9-10 percent more than those without education (missing category) while graduate students consume 81-82 percent more than those without education. These results are similar to those of other countries (IMF, 2011) except for slightly weaker experience effects in boosting welfare and stronger effects of household size on reducing welfare. The returns to education are comparable to those of Cameroon and Ghana but lower than Tanzania, Uganda, and Zambia, but this could be related to level of development i.e., returns are higher at lower levels of development (Psacharapoulos 2018).

11. Given high income inequality, it is important to control for family wealth because being unemployed may represent a "privilege" available only to the well-off. We proxy wealth by the level of education of the parent of the head of household and interact the level of education with the state of being unemployed. The hypothesis is that for families with original wealth, the impact of the state of unemployment will be less severe than for families not endowed with wealth**.** The results support this hypothesis since compared to someone out of the labor force (control group) being unemployed does not lower welfare when the parent of the head of household has a college degree. On the other hand, the consumption of an unemployed individual with a parent having only primary school education is 13 percent lower than the control group. In isolation without interaction terms, an unemployed person has lower welfare than other categories, whether according to the ILO or Nigerian official definition. The coefficient for both groups is the same at -0.06 indicating that those fully unemployed and those working between 1-20 hours per week exhibit welfare levels about 6 percentage points lower than the control group.

Figure 6. Education Level by Type of Worker
(Percent of Workers Within a Group)



Source: Nigeria 2018/19 household expenditure survey and staff estimates

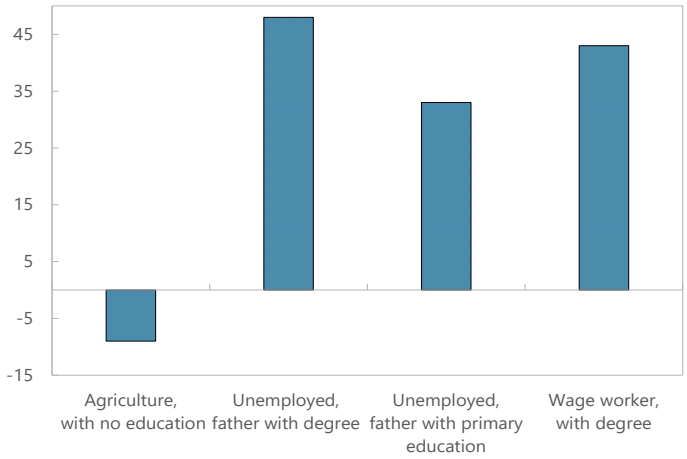
12. To sharpen the focus and make welfare comparisons across categories more realistic, we consider how the education dimension affects the welfare of different worker types. Figure 6 shows the education distribution of various worker types and reveals two distinct groups - unemployed and wage workers with a large majority holding upper secondary or college certificates and, at the other end of the spectrum, household enterprises and agriculture workers with a large element uneducated.

13. Combining information on the education distribution with the coefficient estimates reveals large welfare disparities across worker types with agriculture workers by far the worst-off. To understand the magnitude of the differences, we compare the welfare of an

agricultural worker with no education with three other types of workers: (i) an unemployed individual with a college degree and a college educated father (ii) an unemployed individual with a college degree with a primary educated father, and (iii) a college educated wage earner. The comparison reveals that an agricultural worker with no education is 10 percent worse off than those outside the labor force, while the unemployed person is between 33 and 46 percent better off depending on the education level of the parent (Figure 7). The wage worker has a premium of 43 percent over the person out of the labor force.

14. The analysis suggests that some of the unemployed can afford to be without work because they are supported by relatively wealthy families and may have reservation wages. They may be considering the option value of waiting for a job that offers characteristics that match their preferences. Of course, in advanced and some emerging markets, the social welfare system is an important source of income for the unemployed but in Nigeria, the social welfare system is in its infancy. The system was developed with assistance from the World Bank, and covered 400,000 families in 2016, each being provided with 5000 naira per month. The program was expanded following the COVID-19 pandemic to 1.2 million households as of November 2020. Moreover, current plans aim to cover an additional 7.5 million urban households over a 2-year period and expand rural support recipients by an additional 5 million. The social registry already contains about 30 million persons.

Figure 7. Welfare Coefficients According to Worker Type[1]



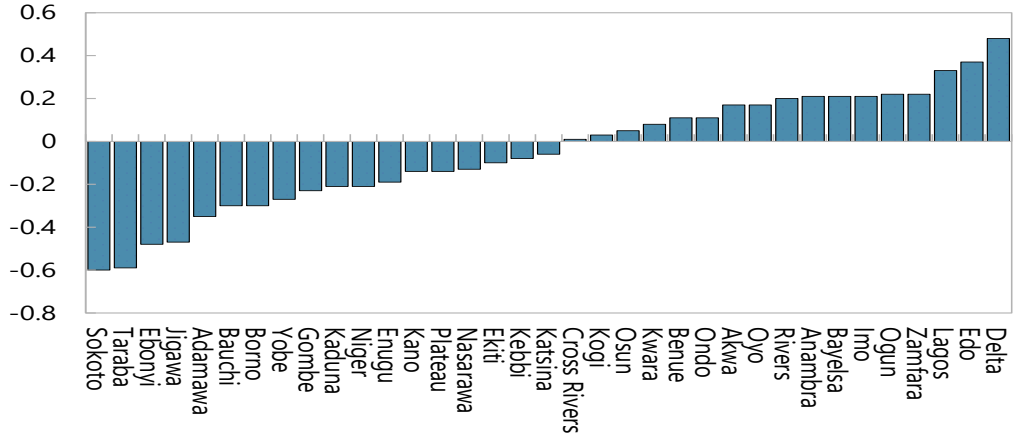
[1]Relative to someone out of the labor force with no education
Source: Nigeria 2018/19 household expenditure survey and staff estimates

15. Household enterprise families earn slightly more than private sector wage earning families, controlling for the level of education. We often hear the argument of the importance of increasing wage jobs in the private sector because this can confer benefits to the recipient and is a source of tax revenues for the government. However, other results have shown that the welfare of those working in household enterprises is at least as high as wage workers (Fox 2012, Thomas, 2015) controlling for the level of education and this finding is confirmed for the case of Nigeria. The household enterprise -private wage differential is at 5-6 percentage points but is dwarfed by differences in education returns. Since wage workers have higher education levels, there is a net benefit to acquiring education, but household enterprises are considerably more productive than agricultural workers, notwithstanding similar levels of education.

16. Massive disparities exist in state welfare levels even after controlling for the above features underscoring the high degree of inequality in Nigeria. In estimating the coefficients on control variables and on the various employment categories, the regression controls for state effects

and these state differences dwarf the differences in employment categories. For example, the differences in welfare between the south eastern states of Ebonyi and Taraba and the business capital Lagos are almost 90 percent with similar gaps for the northern states of Sokoto and Jigawa (Figure 8).

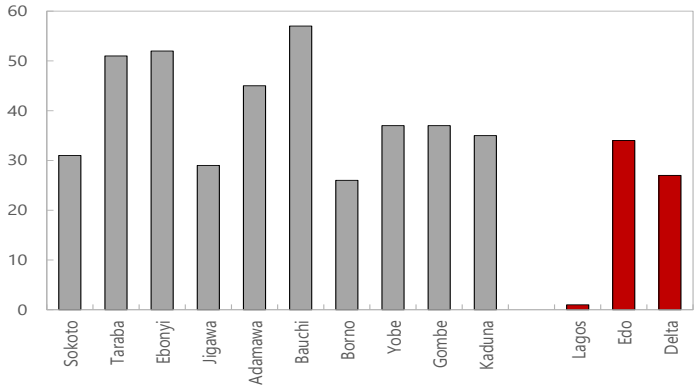
Figure 8. State Specific Welfare Coefficients (in Percent of Abia State Benchmark)



Sources: Nigeria 2018/19 household expenditure survey and staff estimates.

17. Some of the states with the highest adverse welfare coefficients contain the highest shares of agricultural employment, thereby creating an additional negative reinforcing factor. For example, an uneducated agricultural worker in Ebonyi or Taraba consumes 147 percent less than an unemployed individual in Lagos (Figure 9). While regional price differences account for some of the disparity, the difference in welfare is enormous and far higher than those in other SSA countries (REO 2010). This underscores the urgency of improving agricultural production in the poorer states.

Figure 9. Agriculture Employment Shares-Poorest (Grey) and Richest (Red) States



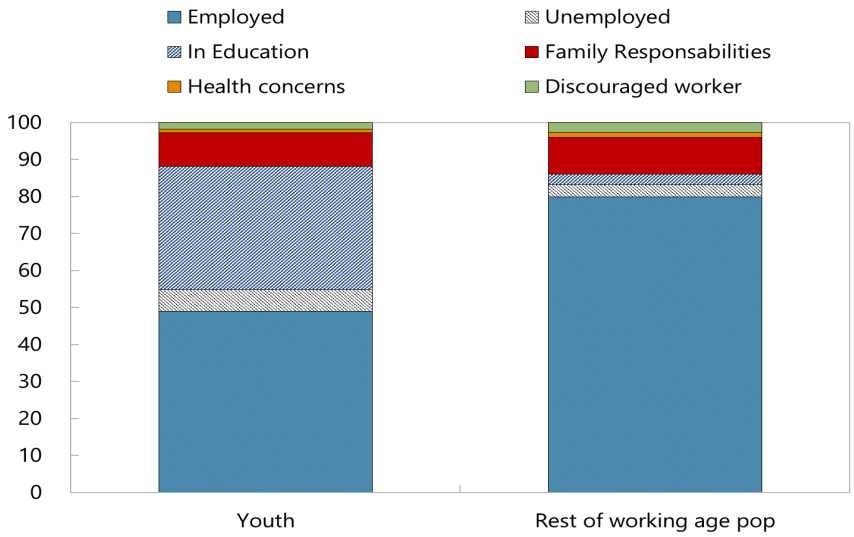
Source: Nigeria 2018/19 household expenditure survey and staff estimates

18. The agricultural sector is a clear contributor to the variability of welfare levels across states, both in terms of the share of agricultural employment across states and the relative productivity levels and is the major focus of rest of the paper. However, the level of violence across states also has high explanatory power, especially following the upsurge in conflict associated with Boko Haram in 2009. The problem has got worse over time – 2020 was the worst year on record in terms of the number of conflict and political violence events, even if the number of conflict related deaths was below the 2015 peak.

Box 1. Job Availability Among Young People

Many concerns have been expressed about the availability of jobs for young people and the possibility that this generation can easily become disenfranchised with society. Data from the national authorities indicate that the unemployment rate among those aged between 15 and 24 years old is very high and persistent. This paper has shown that we must be very careful with use of data, and, indeed, when we consider that a large share of young people is still in education, the picture becomes more nuanced.

Detailed data from the most recent household survey in 2018 indicate that **a large proportion of young people are still studying in various education establishments and this is the main reason why the employment rate among this age group is low relative to the average**. For example, while the employment rate among youth is below 50 percent, this can be explained by the 40 percent of youth remaining in education. When we aggregate the employment rate and the schooling rate for the youth and for the rest of the population, the figures are very similar. Moreover, the discouraged worker effect, while evident for the youth, is comparable to the rest of the population.



19. Violence affects employment opportunities through disrupting economic activity. It destroys productive assets, diverts resources, and damages health and education systems, especially in areas already strained by high levels of inequality and poverty. Indeed, the states that are among the poorest according to the 2018 household survey are precisely those most adversely affected by conflict. Five of the ten poorest states show high rates of violence measured by political deaths: Borno (the state with consistent high levels of violence), Yobe, Adamawa, Kaduna, and Taraba. The strong link between conflict and the labor market is also seen by the coincidence between the peak of the employment population ratio in 2016 with a sharp drop in armed conflicts across the country that year. Since then, the combination of greater insecurity, low oil prices, and lack of economic diversification has resulted in a decline in job opportunities (although data sources differ in the extent of the decline).

D. How to Raise Incomes of Agriculture and Agro-Processing Workers

20. The future increase in the working age population in Nigeria will require a massive increase in employment opportunities to keep the rising workforce employed. This can be achieved through a successful process of structural transformation, a process that begins in the agricultural sector with rising productivity and diversification generating rising incomes, and this process facilitates a gradual move into industry and services.

Recommendations

21. To kick start the process of structural transformation, many deep structural changes are needed in the sector to raise productivity levels. We focus on three key areas:

- Low food yields associated with the lack of improved seeds, fertilizer, large absence of irrigation, and diminished extension services
- Inadequate storage facilities resulting in food and income loss for farmers, putting upward pressure on prices
- General absence of secure land titles and small average farm size that limits access to financing and restricts regional migration

22. Nigeria remains less productive than other large SSA countries such as South Africa and Ethiopia and ends up importing a large share of its food consumption. The Federal Ministry of Agriculture has estimated that the annual food import bill is $5 billion and therefore food production and yield improvements are needed to bring this to a manageable size and to improve incomes. While recent developments are promising with some large companies making significant investments in supporting the substitution of imports with locally grown produce (sugar and wheat), crop yield estimates in Nigeria remain low even on a Sub-Saharan level. Recent estimates from the OECD reveal that Nigeria yields remain below those of Ethiopia and South Africa and are only comparable to Rwanda and Uganda for pulses (Table 2). Moreover, even though yields are improving in rice with considerable financial support from the central bank, they remain far below the other countries.

Text Table 2. Agriculture Yields
(Kg per Hectare)

	2017 maize	2017 pulses	2017 wheat	2020 rice
Nigeria (2019)	2500	900	1500	2300
Ethiopia	3675	1485	2813	2800
Rwanda	1540	868	1325	3900
Uganda	1635	950	no data	2800
South Africa (2019)	5400		3300	no data

Sources: OECD_FAO 2021 report, Statistics Rwanda and Uganda, Central Statistics Office, Ethiopia

23. One of the major ways of improving yields is to increase the synchronous usage of improved seeds and inorganic fertilizer. The latest household survey indicates that less than 10 percent of farmers use improved seeds and inorganic fertilizer in combination, compared to 40 and

30 percent in Ethiopia and Kenya. Moreover, recent work on East African countries has shown that proper use of these inputs can increase yields fourfold (Thomas 2020). While Nigeria already offers fertilizer subsidies to farmers, there is a lack of knowledge of the correct frequency and quantity of usage and of the need to combine fertilizer with improved seeds. A voucher system could be adopted that requires purchase of fertilizer and improved seeds in tandem as well as the provision of enhanced extension services (see Mghenyi et al. 2021 for more details).

24. Nigeria is already using digital technology to increase climate knowledge and lower the cost of doing agricultural business. It ranks third behind Kenya and South Africa in terms of the number of scalable disruptive agro-tech hubs (Kim et al. 2020)**.** However, while digital platforms are used to improve access to inputs and crowd-funding capital, more needs to be done. This is especially true given the climatic shocks facing Nigeria in future underscoring the need for the government to support usage of digital tools to monitor climate risks, to relay extension and advisory services, and to help diagnose agronomic problems faced by farmers.

25. Once the food is grown in Nigeria, a large share (up to 40 percent) is lost through rotting (World Bank 2020). This is linked to poor storage and drying facilities and poor distribution networks that inhibit produce to be transported across the country quickly enough to keep produce fresh. The government is cognizant of these problems and has begun supplying some states with iced-fish boxes, smoking kilns, and solar dryers. A warehouse receipt system (WRS) has also been introduced to enable farmers to access finance by liquidating part of the value of their non-perishable commodities while searching for better prices. However, the legal and regulatory framework for WRS is incomplete since the transfer of warehouse receipts is not yet accepted as equivalent to transferring the underlying asset. As an additional incentive for using storage facilities, an insurance regulatory framework and separate body could be set up to cover warehouse content damages and to certify warehouse administration. These steps would help farmers conserve their produce and get better access to financing for future investments.

26. An important institutional constraint that limits access to financing and regional migration is the general absence of legal land titles. Group ownership of land reduces tenure security and fragments ownership among future heirs. A presidential Technical Committee for Land Reform was set up in 2009 to address these issues but implementation speed differs considerably across states. Out of a representative sample of six states, Kano, Cross Rivers and Jigawa have made considerable progress in the setup of geographic information systems, digitized land records, titled certificates of occupancy and a separate budget line for land tenure registration (Ghebru and Kennedy 2019). However, as of 2019, these elements have generally been absent in Katsina and Ondo and only partially met in Kaduna. Innovations in GIS and land digitization can enable governments to move away from manual, paper-based systems and help reduce processing times for land registration (more than two years for some customers). Finally, land titles also promote transparency and reduce transaction costs, including those associated with corruption. However, in discussion with Nigerian authorities, they indicated that uncertainty on land titling was not a major constraint on agriculture. They put much greater emphasis on the importance of strengthening the farm cooperative culture.

Government Initiatives

27. The government has adopted some policies on enhancing productivity and improving access to finance and is currently formulating its medium-term strategy for 2021-25. The government initiated an agro-processing productivity enhancement program (APPEALS) in 2017 supported by a $200 million program from the World Bank to support rice, maize, wheat, and cassava. The outcomes have been positive with yields per hectare in the selected areas increasing between 20-37 percent and currently stand above the Nigerian average at 3500 kg for maize, 2160 kg for wheat, 20000 kg for cassava, and 5500 kg for rice (World Bank, 2021).

28. The government recognizes the importance of access to finance in the development of sound micro companies in the agriculture sector with the central bank providing this service since the late 70s. The central bank's most recent initiative, the Anchor Borrowing Program (ABP) was created in 2016 with the objective of facilitating credit access and improving farm finance in rural areas. Rice is the main crop supported by the central bank (80 percent of funding as of mid-2020), although the initiative has recently diversified into other crops. The anchor program has had positive reviews in terms of its impact on yields (Opeyemi et al. 2020), family income and employment. An alternative benchmark of loan success is the repayment ratio, i.e., the proportion of loan recipients who have fully paid off their loan. This yardstick is a little less flattering since the repayment ratio from the commercial agriculture venture scheme initiated in 2009 stands at 67 percent while the repayment speed for ABP is at 24 percent, both metrics as of end-December 2020 (Central Bank of Nigeria, 2020).

29. Early indications of the government's agricultural strategy for 2021-25 suggest that its priorities for the agricultural sector match many of the components listed in this note. Two of its eight identified priority goals overlap with the priorities listed here. These cover (i) increasing national output and productivity of six priority value chains (cassava, maize, rice, soya, tomato and yam) through building the capacity of the National Agricultural Seed Council, strengthening the input industry associations, partnering with private logistics and distribution companies, and private sector finance groups to create an inputs fund; (ii) reducing post-harvest losses via efficient storage, logistics and market linkages through investments in collection infrastructure and leveraging digital tools. The hope is that these plans materialize into actions.

E. Conclusion

30. The economic situation of agricultural workers, the most disadvantaged economic group in Nigeria, can be improved by following well-supported policies. While a lot of emphasis has been placed on the high unemployment rate in Nigeria, its level based on standard international definitions is comparable to the rates in many low income SSA countries and has fallen considerably since the onset of the COVID-19 pandemic. The bigger issue for Nigeria is the disparity of consumption levels between agricultural and other workers especially in remote areas of the country. Since agricultural employment accounts for almost 50 percent of the labor force, this is a macro-critical issue. While macroeconomic policies are not particularly suitable for addressing changes needed in the agricultural sector, there is a vast literature that provides consistent advice on how to remedy the situation. This includes

- Improving yields by combining inputs, especially inorganic fertilizer, and improved seeds
- Reducing the fraction of food that rots to help reduce income disparities through improved storage facilities and the development of a competent warehouse receipt system
- Support collateral and inter-regional mobility by completing the land tenure registration system and encouraging the development of farm cooperatives

31. The government should maintain its renewed focus on the agricultural sector. It already recognizes the importance of agriculture for the national economy through the adoption of policies to improve yields and provide loans to farmers generally excluded from access to finance. Moreover, going forward, the government has included many of the recommended policies from this chapter in the latest version of its 2021-25 medium term strategy for the agricultural sector. The hope is that it will be able to deliver on these promises to improve the welfare of those employed in the sector and hence reduce inequality.

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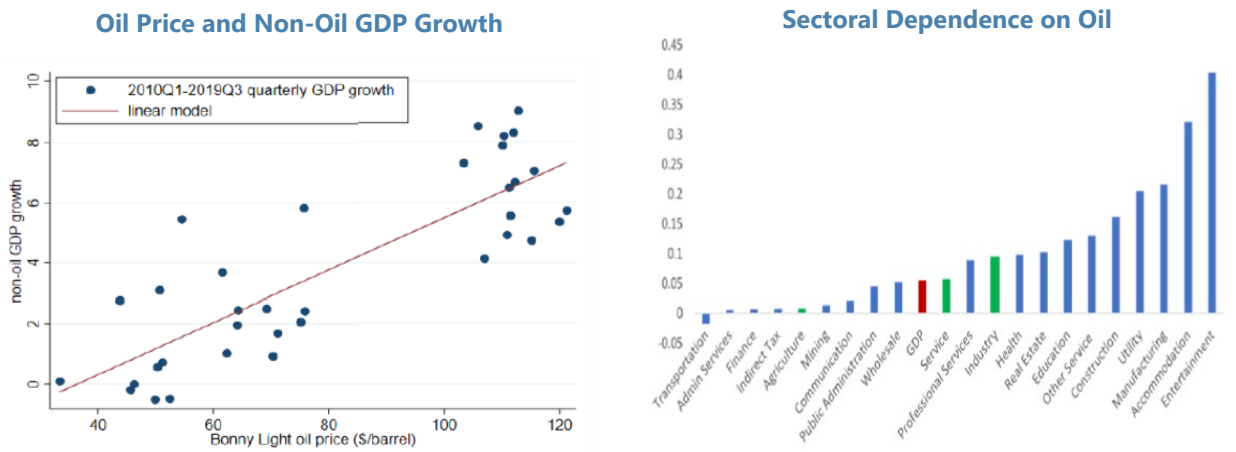
TRADE DIVERSIFICATION IN NIGERIA: HOW TO GET THERE?[1]

A. Introduction

1. The Nigerian economy, the largest in Africa, remains highly dependent on oil, and it has achieved limited diversification over time (Figure 1). In 2020, Nigeria produced 26 percent of the GDP of Sub-Saharan Africa (SSA) and 63 percent of West Africa's output.[2] The impact of oil on the economy goes much deeper than the sector's share in total output, which was 11 percent over the past decade, on average. Previous analysis by staff (Yao and Liu, 2021) finds strong positive correlation between oil price developments and the non-oil sector, indicating that at least 30 percent of the economy is indirectly dependent on the oil sector. In turn, high economic dependence on oil impedes diversification through overshadowing, among others, the competitiveness of other tradeable sectors, particularly manufacturing.[3]

Figure 1. Dependence of the Nigerian Economy on Oil



Source: Yao, J. and Liu, Y. 2021. "Difersification in Nigerian Economy". IMF Country Report No. 21/34

2. This paper explores how Nigeria could achieve trade diversification. Yao and Liu (2021) discussed the dominant role of oil in the Nigerian economy, why diversification has proved to be difficult, and possible lessons from the successful experiences of Asian countries for Nigeria. This follow-up paper starts by presenting facts about Nigerian exports, trading partners, and trade with SSA in Section B, before offering in Section C an overview of regional trade agreements and their benefits, including from joining the African Continental Free Trade Area (AfCFTA). Section D examines the extent to which the country has achieved greater export diversification and

[1] Prepared by Weronika Synak and Rima Turk.

[2] West Africa includes 15 countries: Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo.

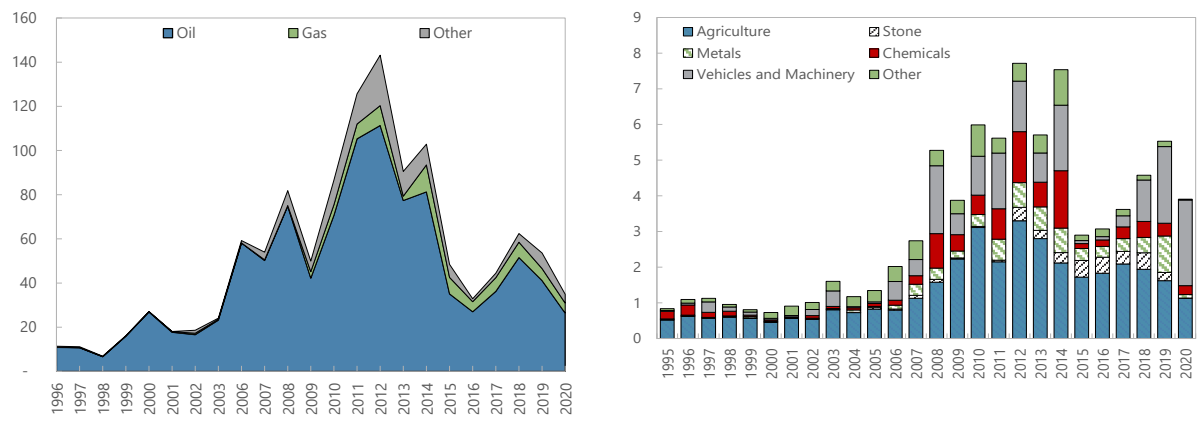
[3] See Yao and Liu (2021) for the channels through which dependence on oil impedes diversification, including failure to develop non-resource sectors due the "Dutch disease", the tension between short-term gains and long-term development strategies, technical difficulties of managing resource wealth, and entrenchment of vested interests.

participation in global value chains (GVCs). Section E sheds light on trade restrictions that hinder achieving greater trade diversification and Section F proposes trade-enabling reforms.

B. Trade Composition and Partners

3. Crude oil and gas continue to dominate Nigeria's exports, and the composition of non-hydrocarbon exports changed little over the past decades (Figure 1). Fuel exports peaked at $111 billion in 2011 and, following the oil price plunge that began as of mid-2014, before dropping to $27 billion in 2016 and reaching $31 billion in 2020. The share of oil in total exports has remained persistently high at above 90 percent since early 1980s. In comparison, non-oil exports are quite low ($4 billion in 2020, 11 percent of total exports). Agricultural products—e.g., cocoa beans and butter, sesamum seeds, cattle skin leather, cashew nuts, and tobacco—are generally the largest non-fuel export products ($1.2 billion in 2020), though exports of vehicles and machinery surged in 2020 (at $2.4 billion), including helicopters (of an unladen weight exceeding 2000 kgs) and different types of vessels and other floating structures (such as oil platforms) for breaking up.[4]

Figure 2. Oil and Non-Oil Goods Exports



Source: UN Comtrade.

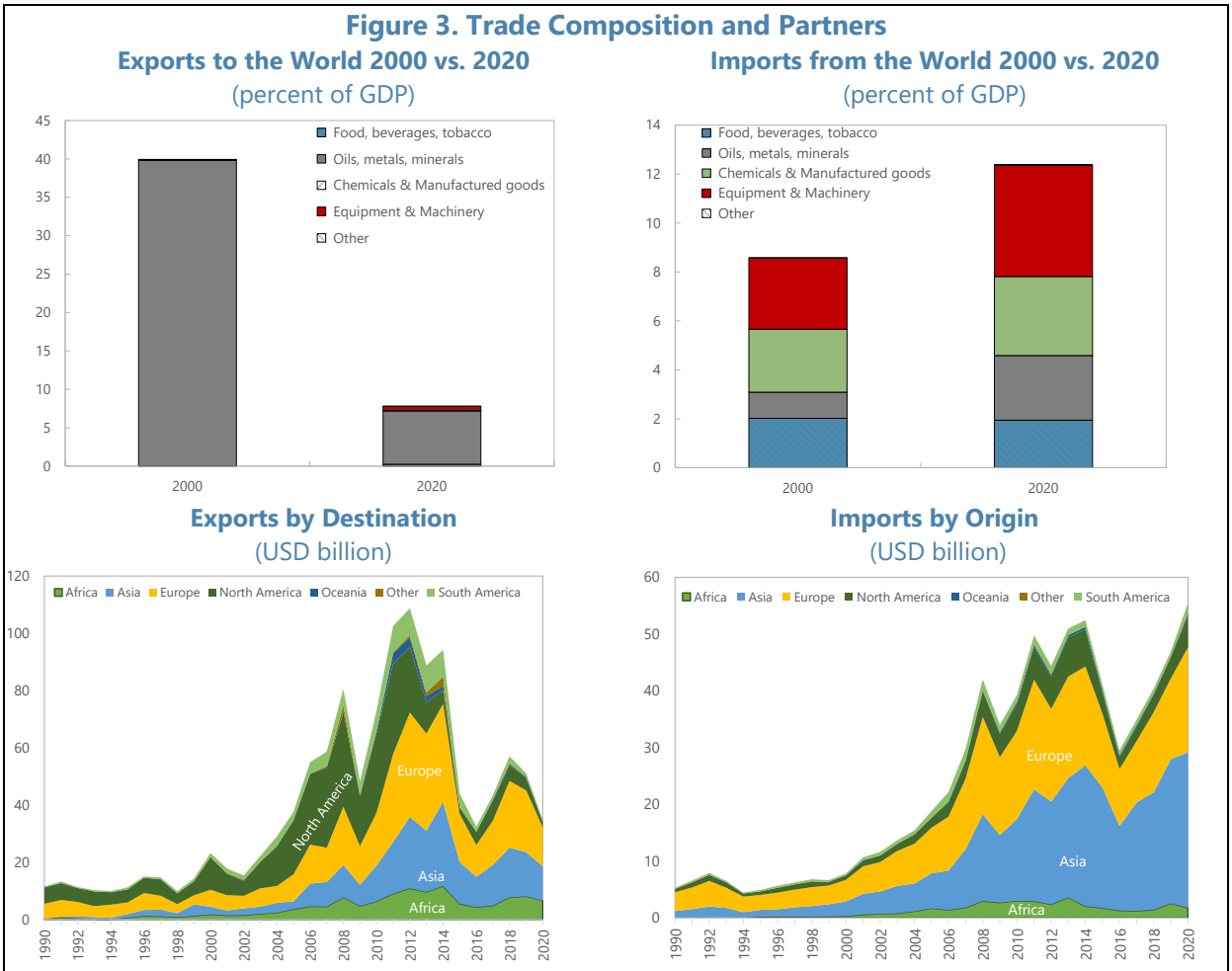
4. Measured as percent of GDP, Nigeria's foreign trade has declined over time (Figure 3). Over the past two decades, exports collapsed from 40 to 8 percent of GDP[5], whereas imports rose only modestly from 9 to 12 percent of GDP. The main export destination for Nigerian products (mostly crude oil) are India, USA, and Spain. Over one-third of all imports come from China (mostly

[4] Caution is warranted not to interpret rising machinery exports as an expansion of the manufacturing sector in Nigeria, as helicopters, vessels, and other floating structures are foreign manufactured goods that were re-exported from Nigeria (according to data from the Nigerian Bureau of Statistics (NBS) trade report for 2021Q1). Re-exports are goods of foreign origin which entered Nigeria to be consumed but are subsequently sold to another country without any substantial transformation. In other words, they are exported in the same condition as imported. In 2021Q1, they represented 83.5 percent of total manufactured goods exported from the country

[5] The collapse is mostly due to lower oil production in 2020 relative to 2000, with oil prices marginally higher in 2020 than in 2000.

machinery and equipment, textiles, and metals), followed by the Netherlands (mostly mineral fuels and other mineral distilled products), and India (mostly machinery, chemical and vehicles).

Figure 3. Trade Composition and Partners



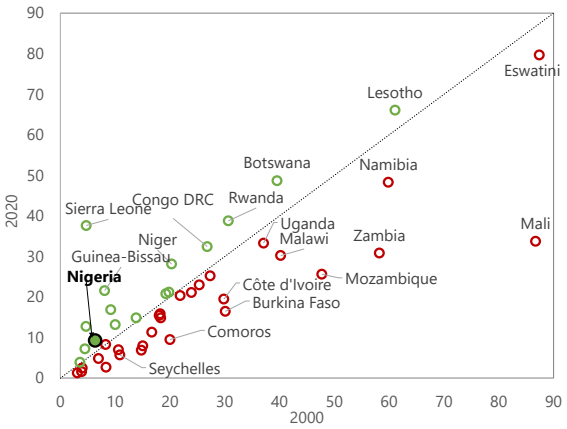
Source: UN Comtrade, Harvard Atlas of Economic Complexity.

5. Trade with SSA also remains very low, though trade complementarity with SSA shows potential (Figure 4). In 2020, only 5.5 percent of imports and 12.7 percent of exports in Nigeria were from/to SSA. In return, 16 percent of SSA exports and 13 percent of SSA imports originated in/went to Nigeria. Similar to many other countries in the region, Nigerian trade with SSA has barely increased over the past two decades. However, the trade complementarity index, which indicates the extent to which the export profile of a country matches or complements the import profile of another, suggests that Nigeria could potentially gain from greater intra-regional trade with SSA. While Nigeria trades more with the world than it does with SSA, its trade complementarity is higher with SSA than with the world.[6]

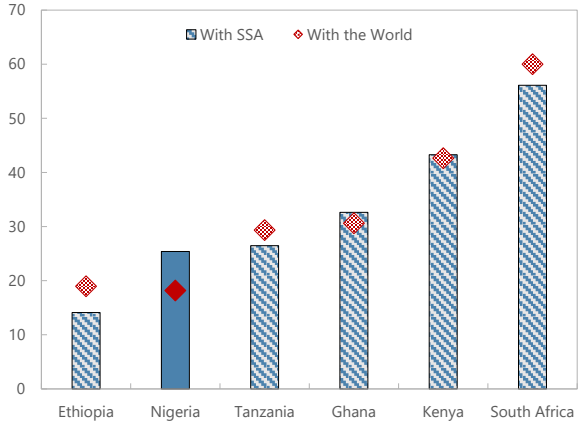
[6] The trade complementarity index is particularly useful in evaluating prospective bilateral or regional trade agreements (WITS).

Figure 4. Trade with Sub-Saharan Africa

Intra-Regional Trade[1] in SSA: 2000 and 2020
(in percent of country total trade)



Trade Complementarity Index, 2015
(Index; 0 to 100, least to most complementary)

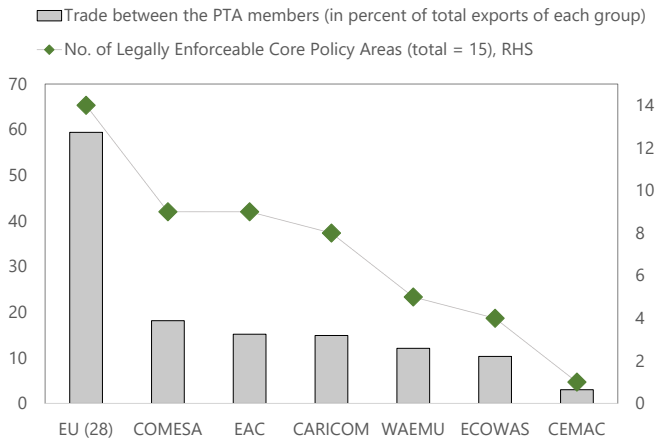


Source: IMF DOT database, WITS.
[1]Intra-Regional trade share is calculated as the average of intra-regional imports and export shares.

C. Trade Agreements

6. Nigeria's preferential trade agreement (PTA) under the Economic Community of West African States (ECOWAS)[7] lacks depth compared with other regional trade blocks. PTAs have boomed in recent years, increasing from 20 in 1990 to 330 in 2020, 256 of which are currently in force (World Bank Deep Trade Agreement Database). Being part of the ECOWAS, Nigeria has one PTA with 52 countries, with the objective to increase regional cooperation and liberalize tariffs on industrial and agricultural goods. More recent PTAs, however, are becoming increasingly "deep", extending their reach well beyond these traditional policy areas. The depth of PTAs is assessed by the coverage of core provisions, including trade remedies (i.e., countervailing measures, antidumping duties) and a broader set of behind-the-border policy areas (i.e., investment, competition, intellectual property rights), as well as the number of legally enforceable provisions. In turn, the depth of PTAs correlates with higher intraregional trade.

Figure 5. Depth of PTAs[1] and Intra-Regional Trade



Source: WB Deep Trade Agreements Database, IMF DOT.
[1]Depth = number of core policy areas legally enforceable.

[7] ECOWAS established its free trade area in 1990 and it adopted a common external tariff in January 2015. The other fourteen ECOWAS members are Benin, Burkina Faso, Cabo Verde, Cote d'Ivoire, The Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Senegal, Sierra Leone, and Togo.

7. The depth of trade agreements matters for increasing trade flows. Shallow agreements are controversial because they are inherently discriminatory. Members grant tariff concessions to each other, leaving tariffs on imports from non-members unconstrained. The resulting tariff preferences are likely to increase trade between members (trade creation), but they can also lead members to substitute imports previously sourced from non-members for within PTA products (trade diversion). In contrast, deep trade agreements go beyond tariff liberalization to reduce trade costs and discrimination through the implementation of behind the border measures (e.g., provisions relating to competition policy, subsidies, or standards). Recent evidence suggests that, not only does deepening of trade agreement lead to more trade creation, it also creates positive spillover effects, or "negative" trade diversion, as it does not happen at the expense of trade with non-members (Baldwin, 2013; Mattoo, Mulabdic, and Ruta, 2017).[8]

8. In December 2020, Nigeria ratified the African Continental Free Trade Area (AfCFTA), which is a deep trade agreement that removes various barriers to trade among African countries. The AfCFTA has the potential to create the world's largest free trade area, supporting trade creation, structural transformation, productive employment, and poverty reduction. The treaty removes tariffs from at least 90 percent of trade within the continent and includes policies aimed at eliminating non-tariff barriers such as customs delays. It is a deep trade agreement because it covers policy areas like trade facilitation and services, as well as regulatory measures like sanitary standards and technical barriers to trade, which have so far not been considered under regional trade agreements. It has been designed as a multi-stage process, with negotiated issues to be constituted into legal instruments. Phase 1 involves issues on rules of origin, schedules of tariff concessions, and schedules of specific commitments on the five priority service sectors (business services, communications, finance, tourism, and transport), with Phase 2 negotiations focusing on intellectual property rights, investment, competition policy, and Phase 3 about e-commerce (UNCTAD, 2021).

9. A number of studies have assessed the potential benefits to SSA and Nigeria from the AfCFTA.

- The AfCFTA could expand intraregional trade in SSA by more than 80 percent, with relatively limited adverse effects on trade with nonmembers. Estimates of welfare gains for the continent are up to 2.1 percent in efficiency deriving from reductions in tariff and non-tariff trade barriers (Abrego et al., 2020). Other studies show real income gains as high as 5 percent (Chauvin, Ramos, and Porto, 2016) or 7 percent ($450 billion) for the continent, and 4.2 percent for Nigeria relative to baseline by year 2035 (World Bank, 2020a) under the assumption of reducing both tariffs and non-tariff barriers, as well as improving infrastructure (trade facilitation).[9]

- Full implementation of the AfCFTA (World Bank, 2020a) could lift 68 million in Africa out of moderate poverty by 2035, about half of whom would be located in Ethiopia (8.2 million),

[8] Specifically, a one standard deviation increase in the depth of the partner's trade agreements with other countries increases bilateral trade by around 19 percent (Matoo, Mulabdic and Ruta, 2017).

[9] If only tariffs are liberalized, Nigeria's real income would not benefit from the free trade area, though trade would slightly increase (World Bank, 2020).

Nigeria (7 million), Tanzania (6.3 million), the Democratic Republic of Congo (4.8 million), Kenya (4.4 million), and Niger (4.2 million).

- As employment shifts from sectors of comparative disadvantage to sectors of comparative advantage, agriculture and wholesale and retail trade would provide half of the employment in the continent, though registering shifts in compositional effects. The importance of agriculture as a source of employment is expected to decline (from 36 to less than 30 percent between 2020 and 2035), whereas the participation of wholesale and retail trade sector in total employment is expected to increase from less than 17 percent to 20 percent over the same period. Gains in Nigeria's trade employment share are expected to be twice as high as the continent average at 41 percent (World Bank, 2020a).

- Another study (Olapade and Onyekwena, 2021) finds that the AfCFTA will deliver larger gains to African countries with prior larger shares of imports from the region. For Nigeria, the authors estimate real wage increases and welfare gains at 1.4 and 1.6 percent, respectively, over 2014 levels.

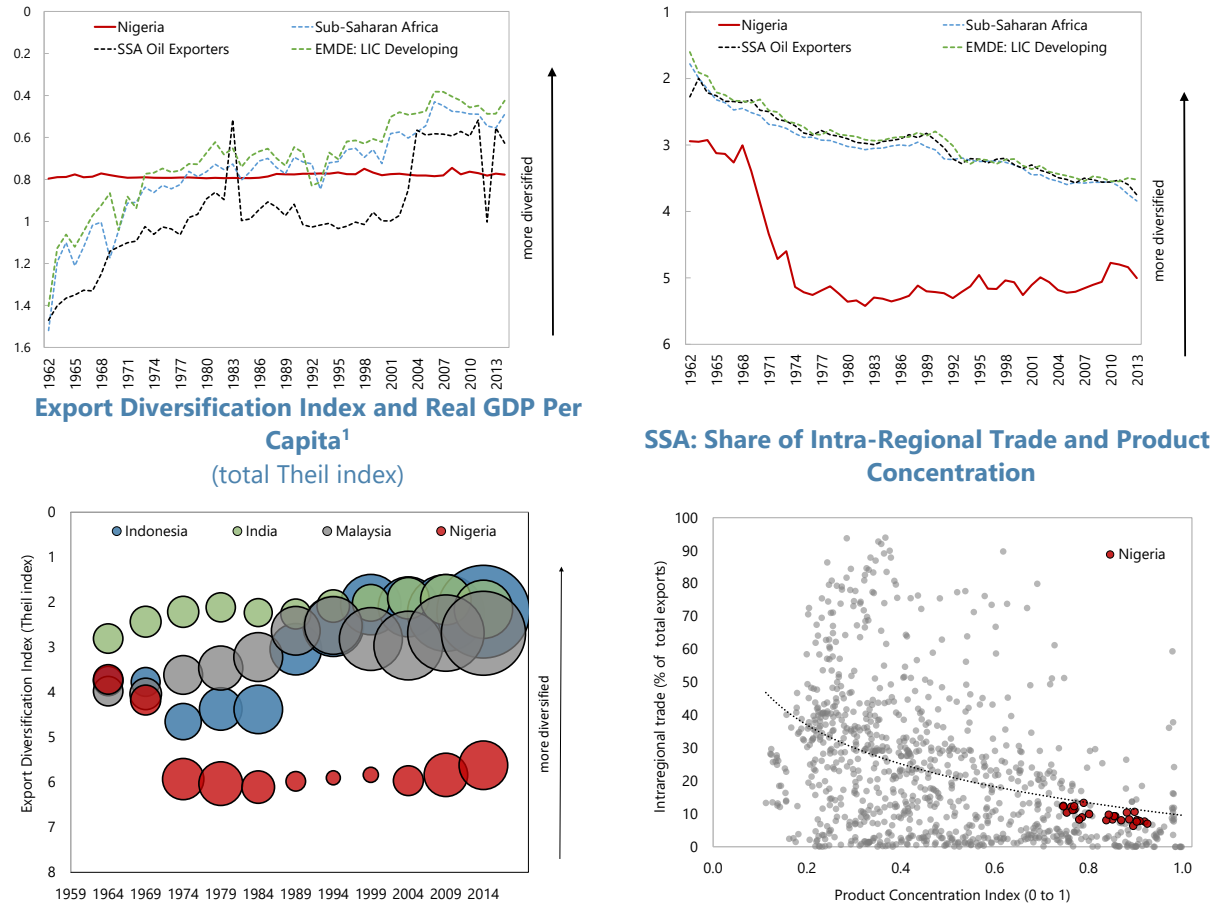
D. Export Diversification and Integration Over Time

10. Nigeria has achieved little export diversification over the past decades. Diversification can be attained by including new commodities in the export portfolio (extensive margin) and changing the share of existing commodities (intensive margin). Over the past decades, Nigeria failed to diversify exports at the extensive margin, nor did it add new sub-products within the oil and the few commodities that it exports to achieve a more balanced mix of exports (Figure 6). Between 1990 and 2020, only 47 new products were added to Nigeria's exports compared with an average increase of twice as many (95 products) for countries like Bangladesh, Cameroon, Pakistan, and Tanzania. In 2020, the total number of export products was 205, compared with an average of 258 for Sub Saharan Africa (SSA). More broadly, the export diversification index remained flat as of the 1970s after it collapsed from the high levels in the previous decade.[10]

11. Diversifying the range of goods produced creates greater possibilities for intraregional trade and opportunities for growth. Countries with more diversified exports tend to have higher shares of intra-African exports than countries with less diversified exports (UNCTAD, 2019). Further, export diversification is shown to be a major determinant of growth (Hausmann, Hwang, and Rodrik, 2007; Cherif and Hasanov, 2019), especially for commodity exporters where breaking the oil spell requires a diversified tradable sector and increasing sophistication (Cherif, Hasanov, and Zhu, 2016). In countries like Indonesia, Malaysia, and India where export diversification increased over time, real GDP per capita rose markedly more than it did in Nigeria.

[10] The export diversification index is the sum of within (intensive margin) and between (extensive margin) Theil indices (Cadot et al. 2011; Papageorgiou, Spatafora, and Wang, 2015).

Figure 6. Export Diversification: 1962-2014



Source: Penn World Tables, Papageorgiou, Spatafora, and Wang 2015, UNCTAD, IMF DOT database.
[1]Bubble size represents real income per capita indexed at 1964 =100.

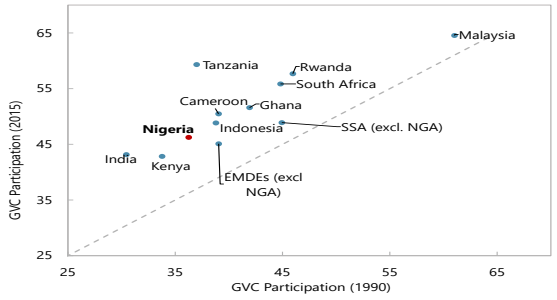
12. Relative to 1990, Nigeria increased its overall level of engagement in global value chains (GVCs). Over the period 1990 – 2015, Nigeria and many other countries increased their participation in supply chain trade (Figure 7). Better integration in GVCs is a process that associates with higher levels of activity over time, as has happened in South and East Asia or Eastern Europe. When a country participates in GVCs, it no longer needs to build up an entire industry to industrialize and be competitive in international markets (Baldwin, 2013). Instead, firms can provide specific skills or basic products to GVCs, or they can produce high-quality manufactured goods for exports. In addition to raising exposure to foreign competitors in international markets and the potential for technology transfer and positive spillovers, the benefits of greater GVC participation could go beyond importing or exporting firms to local firms potentially leading to new industries (African Development Bank, 2014).

13. However, Nigeria is mostly integrated upstream, with firms providing primary products to firms in other countries further down the value chain.[11] An increase in GVC participation over time would ideally take both forms, greater forward and backward integration, similar to what some emerging and developing countries like India, Indonesia, Kenya, Rwanda, and especially Tanzania have achieved (Figure 7).[12] However, a closer look at Nigeria reveals that its increase in GVC participation over time is due to greater forward integration only, as the majority of exports are used by importing countries to produce final goods for export. This kind of upstream production is likely to involve lower value-added activities and it associates negatively with measures of structural change and diversification (African Development Bank, 2014).

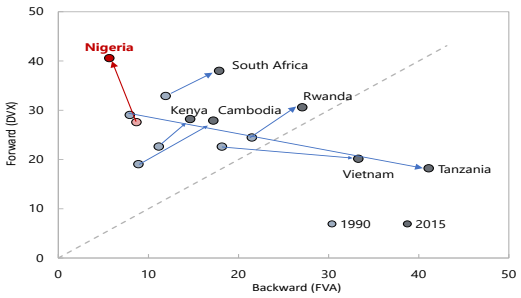
14. In addition, backward linkages are low and they took a step back over time (Figure 7). Nigeria's backward GVC integration is lagging behind significantly, similar to some other oil-exporting countries in SSA albeit to a much greater extent. In contrast, African countries like Botswana, Ethiopia, Kenya, Mauritius, and Tanzania have been able to move into downstream production. Unlike ECOWAS, trade blocks of the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) have increased their share of imported intermediates in gross exports, probably reflecting a reduction in policy-imposed barriers to trade (de Melo and Twum, 2020).

Figure 7. Nigeria and Peers: GVC Participation

GVC Participation: 1990 vs. 2015
(in percent of total exports)



Backward vs. Forward Participation, 2015
(in percent of total exports)



Sources: UNCTAD-Eora Global Value Chain Database

15. Developing backward GVC linkages is important to raise prospects for greater development and higher wage growth (Figure 8). Downstream integration links strongly with structural transformation and it provides opportunities for technology upgrading through the exports of parts and components (African Development Bank, 2014). A one percent increase in backward GVC participation is estimated to boost per capita income by almost 1.2 percent, more

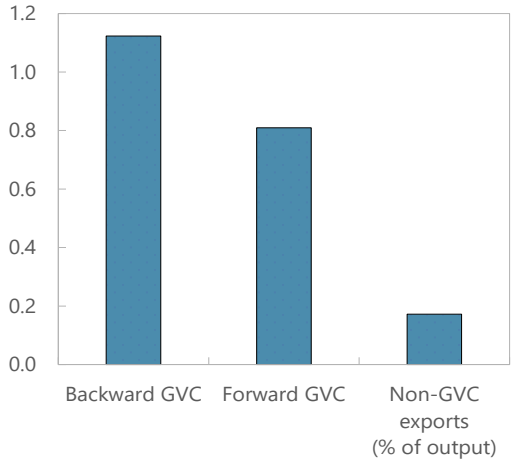
[11] In developing countries where innovation is low, upstream production is more likely associated with the production of raw materials and other basic inputs to production, which may have little scope for upgrading (McGregror, Kaulich and Stehrer, 2015).

[12] Forward integration conveys the extent to which a country is integrated relatively upstream of the value chain (use of its domestic intermediates in foreign country exports) and backward integration reflects the extent to which a country is integrated relatively downstream of the value chain (use of foreign inputs in its exports).

than income gains from froward GVC or standard trade (World Bank, 2020b). When transitioning into exporting basic or limited manufactured products (such as garments) using imported inputs (such as textiles), wages grow faster (as was the case for Bangladesh, Cambodia, Ethiopia, Indonesia, Kenya, Nepal, Serbia, South Africa, Tanzania, and Vietnam). See Box 1 for a summary of successful diversification by some economies.

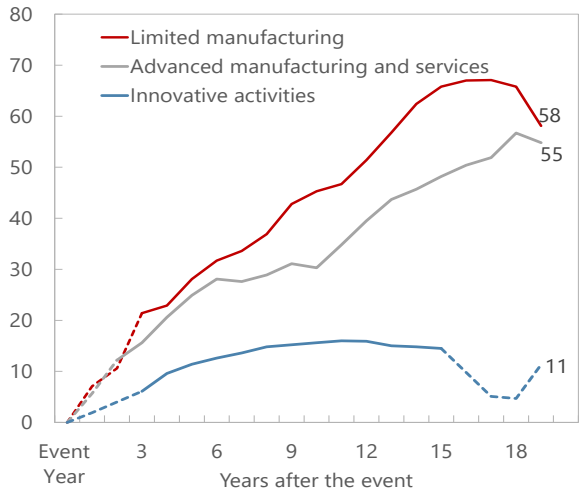
Figure 8. Effects of Breaking Into Limited Manufacturing

Long Run Effects of GVC on per Capita GDP
(effects of a 1% increase in the covariate on the x-axis, in percent)



Sources: World Development Report 2020 (World Bank, 2020b) team, using data from World Bank's WDI database and GVC measures from Borin and Mancini (2015, 2019).

Change in Wages After Entering a Higher GVC Stage
(cumulative, in percent)



Source: World Development Report 2020 (World Bank, 2020b) team. Cumulated change in wages in 20 years after switching from lower to higher GVC engagement. Dotted lines indicate statistically nonsignificant coefficients.

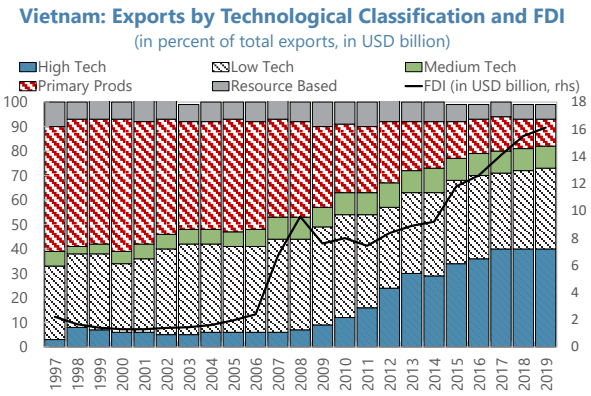
Box 1. Country Examples of Successful Diversification

Many countries whose economies resemble Nigeria's to varying degrees were able to achieve greater diversification over time. While there is no one-size-fits-all solution, economy-wide polices should aim at good governance, better education, improving infrastructure, facilitating trade, and using foreign investments to build productive and innovative manufacturing clusters (Salinas, 2021a; IMF, 2014;). Below we present selected successful examples of countries and undertaken reforms.

- Reforms in **Indonesia** that started in 1980s included creating free trade zones and providing tax incentives. They replaced import substitution polices and dependency on labor-intensive manufacturing (Callen et al., 2014). Customs efficiency improved after introducing private sector-based pre-shipment inspection (Meyers and Oliver, 2015; Yao and Liu, 2021).
- **Malaysia** achieved successful policy mix targeted both high value-added industries with comparative advantage and the expansion beyond already exported products (Cherif and Hasanov, 2014). Investments in research and development, and education helped the vertical diversification of the economy. In addition, the National Industrial Policy and the Industrial Master Plans promoted natural resource processing industries, making Malaysia also a horizontally diversified economy (IMF, 2016).
- **Mexico** moved from industrial policies to economy-wide, horizontal reforms by eliminating most sector-specific subsidies and other incentives (Moreno-Brid, Valdivia and Santamaria, 2005). Enaction of NAFTA enabled the inflows of foreign investment into the automotive industry, which was followed by the development of vertical supply chains within the country (Oxford Business Group, 2017; Cherif and Hasanov, 2014). In the 1950s, the government introduced the maquiladora program allowing foreign companies to import raw materials and parts into Mexico, tax and duty free, under the condition that 100 percent of all finished goods will be exported within a set timeframe. To allow domestic producers compete with maquiladoras, an export promotion program (called PITEX) was introduced in 1990, for Mexican factories that exported at least 10 percent to bring in raw materials duty-free under condition that manufactured goods will be reexported. (Dallas Fed, 2007). The two programs (maquiladora and PITEX) were merged into a single one called IMMEX in 2006.

Source: UN COMTRADE, WB World Development Indicators.

- Reduction in barriers to entry were the first of **Vietnam's** reforms. The country freed access to FX and external trade, and abandoned the rationing system, production quotas, and subsidies. In 1990s, Vietnam's polices focused on the liberalization of FDI, which at first flew into primary products, but later helped to grow a more technologically advanced export base. Vietnam also pursed geographic diversification by trading with the Commonwealth of Independent States (CIS), and then Asia, Europe and the United States (Papageorgiou, Spatafora, and Wang 2015).



Source: WB Integrated Trade Solutions (WITS) and WB World Development Inidcators

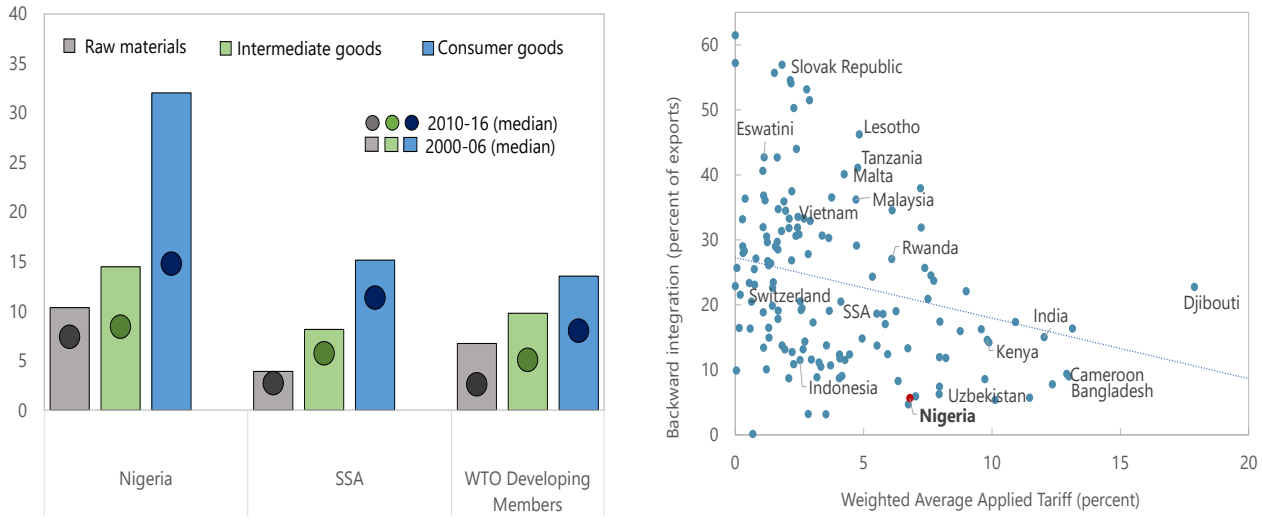
- In **Chile**, the key drivers of export diversification were successful effort to strengthen governance, improve educational attainment and physical infrastructure, as well as liberalize trade policies. (Salinas, 2021a). Most of Chile's trade falls under one of the 25 free trade agreements that the country signed, and therefore it is not subject to tariff and non-tariff trade costs. (World Bank Deep Trade Agreements Database). The country's infrastructure quality and coverage have also improved, with Chile excelling in the quality of port and electricity infrastructure (World Economic Forum Global Competitiveness Report), which are areas that most strongly impact export growth (Salinas, 2021b).

E. Restrictions to Trade in Nigeria

16. Tariff barriers in Nigeria are elevated. While tariffs are determined by ECOWAS, effective rates tend to be higher because the Nigerian government may apply additional charges (levies, excise, and VAT) on imports. High tariffs could be used to protect domestic industrialization in Nigeria, though evidence from other countries suggests that reducing them would increase productivity and exports of manufacturing goods.[13] Given higher average tariffs on raw materials, intermediates, and consumer goods than in SSA, Nigeria is expected to be among the countries that undergo the largest liberalization under the AfCFTA, with the highest declines in tariffs likely to be in manufacturing followed by agriculture (World Bank, 2020a).

17. In turn, high tariffs hurt backward integration. Although Nigeria has, over the years, reduced tariffs substantially within the supply chain of industries, tariffs still display positive escalation in most industries, including food and beverages, textiles and apparels, wood products, paper, printing, and publishing (World Trade Organization, 2017).[14] Tariff escalation hurts trade because it increases the cost of delivery to the final consumer exponentially when production stages take place across tariff-ridden borders. As a result, it exerts a brake on backward participation in GVCs and hinders greater trade integration.

Figure 9. Tariffs on Raw Materials and Intermediate Goods, and Backward Integration



Source: UNCTAD-TRAINS database and UNCTAD-Eora Global Value Chain Database

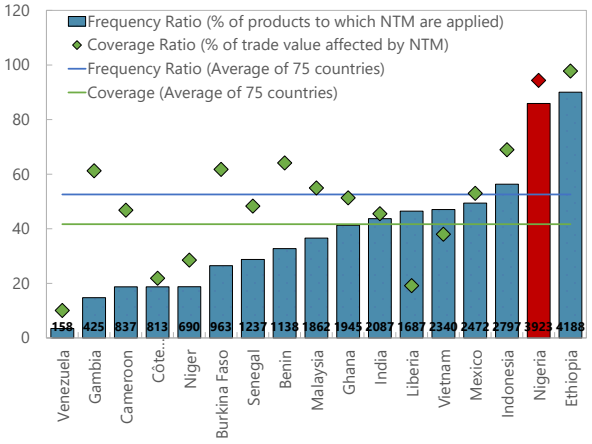
[13] See, for example, de Melo and Twum, 2020; Handley, Kamal and Monarch, 2020; Frazer, 2012. In the EAC, Rwanda's ascent to the customs union saw firms facing lowers tariff on intermediate inputs, which was found to have resulted in an increase in exports of between five to ten percent for exporting firms (Frazer, 2012).

[14] Tariff escalation occurs when tariffs on intermediate goods are higher than tariffs on raw materials, and when tariffs on final products are higher than those on intermediate goods. On the aggregate, tariff escalation in Nigeria was mixed in 2017: the average applied MFN tariff was 10.5 percent on raw materials; 10.2 percent on semi-processed products; and 14.7 percent on fully processed products (World Trade Organization, 2017).

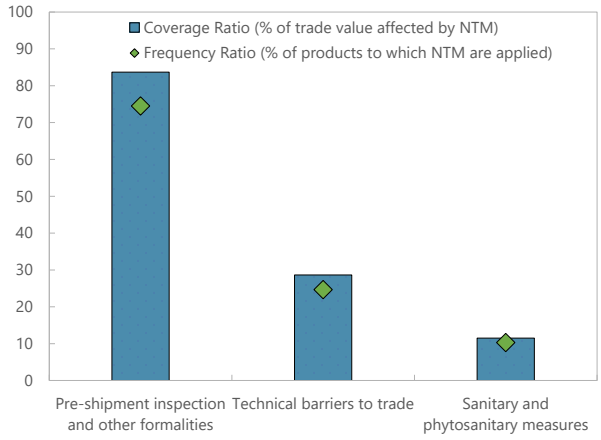
18. Non-tariff Trade Measures (NTM) are also pervasive in Nigeria.[15] Almost 4,000 products are affected by at least one NTM (86 percent of all traded products; 95 percent of value traded). The top NTM is pre-shipment inspection (75 percent of products; 84 percent of traded value), which are activities relating to the verification of quality, quantity, price, including exchange rate and financial terms, and/or customs classification of goods.[16] While Nigeria aborted pre-shipment inspection in 2019 in favor of inspecting imports on arrival, tedious ports inspection processes and costs associated with port storage and demurrage likely increased. Further, select importers may forward cargoes directly to warehouses using the Nigeria Customs Service (NCS) Fast-Track window to undertake customs procedures (examination and payments). However, clearance of imports is typically delayed to the detriment of importers because most imports (e.g., food, drug, and cosmetics) require inspection and/or certification by the government, which lacks the capacity to undertake testing and reviews.

Figure 10. Non-Tariff Trade Measures

Nigeria and Peers: NTMs, Latest Available[1]



Nigeria: Top 3 Non-Tariff Trade Measures, 2013



Source: World Integrated Trade Solutions
Note: Numbers inside the bars on LHS chart show total number of products affected by at least one measure.
[1]Latest available data between 2013-2016.

19. Other non-tariff measures in Nigeria include poor port infrastructure and high burden of customs. While shipping connectivity is better in Nigeria than in other countries on average, trade logistics suffer from poor port infrastructure quality and high transportation costs.[17] To

[15] NTM are policy measures other than ordinary customs tariffs that can potentially have an economic effect on international trade in goods, changing quantities traded, or prices or both. They include technical measures (such as sanitary or environmental protection measures), traditional trade policy instruments (including quotas, price controls, export restrictions and contingent trade protective measures), as well as other behind-the-border measures, such as competition- and trade-related investment measures, subsidies, and government procurement or distribution restrictions (UNCTAD International Classification of Non-tariff Measures 2019).

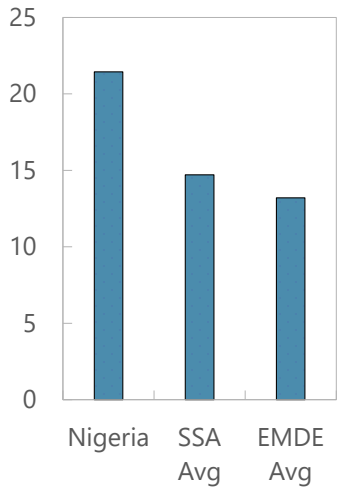
[16] The AfCFTA is expected to create a common set of rules in areas such as competition, technical barriers to trade, and sanitary and phytosanitary standards (UNCTAD, 2021). Pre-shipment inspection will also be tackled under trade facilitation.

[17] An article in the Nigerian news mentions that the price of shipping a container from the Apapa port in Lagos to the mainland (distance of just 20 kilometers) is almost the same as shipping one container from Nigeria to China.

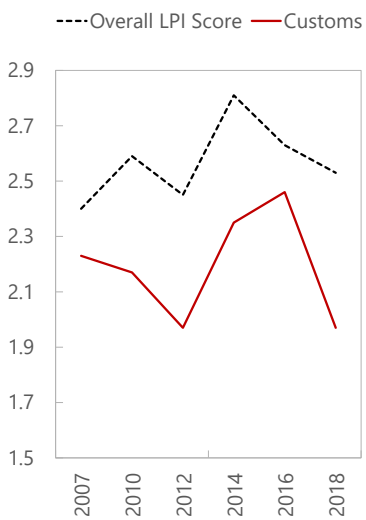
increase competitiveness, Nigeria needs to permanently address the infrastructure deficit (notably in roads and ports) by building on ongoing efforts. Further, onerous customs procedures lead to inefficient border clearance, adversely affecting the capacity to move traded merchandise within and outside borders. While the NCS took steps over time to improve its service, there remains scope to reduce the high burden of customs and accompanying administrative requirements.

Figure 11. Trade Logistics

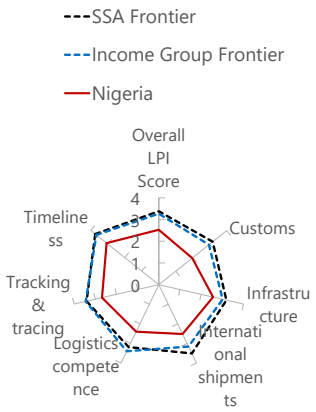
Liner Shipping Connectivity Index[1/] (max=100, higher is better)



Logistic Performance Index, 2007-2018



Logistic Performance Index, 2018



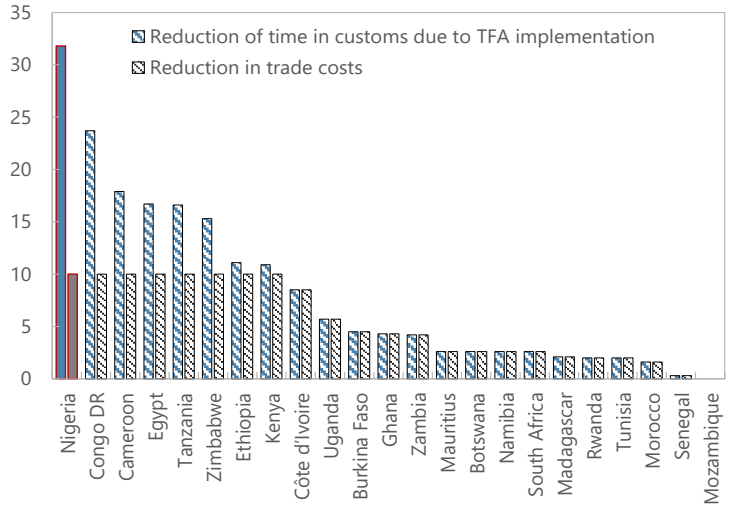
Source: UNCTAD Liner Shipping Connectivity Index (LSCI), World Bank Logistic Performace Index (LPI)
1/ The Liner Shipping Connectivity Index (LSCI) captures how well countries are connected to global shipping networks. It is computed by the United Nations Conference on Trade and Development (UNCTAD) based on five components of the maritime transport sector: number of ships, their container-carrying capacity, maximum vessel size, number of services, and number of companies that deploy container ships in a country's ports.

20. Nigeria is among the top countries that would benefit from the implementation of trade facilitation. The trade facilitation agreement (TFA) under the AfCFTA provides a framework to reduce non-tariff trade costs through simplifying and harmonizing trade procedures and logistics, as well as expediting the movement, clearance and release of goods, including goods in transit across borders.[18] The benefits from implementing trade facilitation under the AfCFTA are expected to rise

[18] Trade facilitation refers to the simplification and harmonization of international trade procedures including transparent practices and formalities, such as customs of licensing procedures, transport formalities, and payment insurance.

as neighboring countries implement it, decreasing trade costs along all borders (World Bank, 2020a). The reduction of delays in customs and in trade costs are expected to be highest for Nigeria than other African countries. Greater trade facilitation would provide an expanded platform for Nigerian manufacturers and service providers for connection to regional and continental value chains. To identify the sources of delays at border controls in Lagos and simplify burdensome processes, the NCS launched a trade facilitation initiative in February 2021 in partnership with the government, local businesses, and business associations (The Global Alliance for Trade Facilitation, 2021).[19]

Figure 12. Impact of TFA implementation on Trade Costs
(in percent)



Source: Estimates from World Bank. *The African Continental Free Trade Area: Economic and Distributional Effect* (2020).

F. Trade-Enabling Reforms

21. Nigeria's development strategy of import substitution (Yao and Liu, 2021) will continue to hold back trade diversification. While the country continues to pursue import substitution, such a strategy fell out of favor in the past few decades after many country experiences (e.g., India, Indonesia, and Malaysia) have shown that it is inefficient and unsustainable (Yao and Liu, 2021). Import substitution creates mostly inefficient firms that rely on a captive domestic market and imported inputs and technology, and which do not have incentives to upgrade their technologies to climb the value-added ladder and compete on international markets (Cherif, Hasanov, and Zhu, 2016). Against this backdrop, Nigeria's historically restrictive import regime presents a strong anti-export bias that hinders export diversification.

22. Ad-hoc administrative measures on foreign exchange and imports also hurt the economy's competitiveness. Nigeria maintains multiple foreign exchange windows. An institutional removal of these windows and allowing all FX transactions to take place at a unified and market-clearing exchange rate are essential to ensure FX convertibility and help the private sector position itself strategically to foster competitiveness. There is also a list of goods that are prohibited

[19] The public and private sectors identified priority sectors that would most benefit from streamlined trade processes. The project will initially focus on exports of processed leather, edible fruits, and chemicals/pharmaceuticals, as well as imports of pharmaceuticals, electronics, and industrial spare parts.

to access foreign exchange.[20] Land borders with neighboring countries were opened on December 31, 2020.

23. Bold reforms are needed to unleash Nigeria's growth potential brought by the AfCFTA. Nigeria's ratification of the AfCFTA presents a historic opportunity to pursue diversification that could yield a positive net export boost if accompanied by trade-enabling reforms. To increase intra-African trade, gain from increased access to cheaper goods and services from other African countries, and spur the development of regional value chains, Nigeria should step up reforms to:

- reduce tariff escalation and average tariffs in line with agreement under the AfCFTA, bringing down tariffs on raw materials, intermediate goods, and finished goods;
- streamline import documentation requirements and enhance the transparency and efficiency of custom procedures, speeding up clearance time;
- address bottlenecks such as port processes and transportation costs, while continuing to expand the capacity of port infrastructure and upgrading roads near the ports;
- harmonize essential rules of origin[21], which affect the cost of a traded product, with other African countries to arrive at a common continental set (as part of Phase I of AfCFTA negotiations);
- improve the customs capacity to enforce preferential rules of origin and detect abuse (which could be severely detrimental to fair competition and customs revenue if origin is not efficiently controlled);
- permanently lift border closures, while addressing security concerns and smuggling; and
- enhance digital connectivity, facilitating communications of firms in GVCs with both their suppliers and their customers through cost-efficient and reliable internet-based technologies.[22]

24. Targeted awareness about the AfCFTA policy would also help reap benefits from trade. A survey shows that over 60 percent of Nigeria's small and medium-sized firms are unaware of the AfCFTA (Centre for the Study of the Economies in Africa, 2021). Even with potential benefits from the

[20] The list of import goods for which access to FX is prohibited includes 42 items.

[21] Rules of origin (RoO) describe the transformation a product must undergo in Africa (e.g., the share of value added) to enjoy preferential market access, If the product can be categorized as Africa made, it would be eligible for tariff concessions, because trade and tariff policy are implemented based on the assigned origin of a product. RoO are used to prevent goods from nonmember countries entering through a low-tariff country and being transshipped duty-free to another member country: too restrictive RoO can negate the preferential market access intended by the AfCFTA and hinder global supply chains; too lenient or mismanaged RoO could provoke a flood of extra regional products with low levels of value added.

[22] The MTN Group (South Africa) announced in August 2021 that it would invest $1.6 billion to strengthen its 4G network services in Nigeria (UNCTAD, 2021). More recently in October 2021, the Nigerian Ports Authority declared that it has in the recent past been working steadily to digitalize operations at all port locations in the country, aiming for optimal efficiency and elimination of corrupt practices (Voice of Nigeria, October 15, 2021).

agreement, information costs reflected in different levels of awareness would prevent businesses from taking advantage of reductions in trade barriers and improvement of trade logistics. That said, there is optimism among businesses that are aware of the AFCFTA (reduction in material and labor costs, increase in production capacity, expansion of market and consumer size, and reduction of prices), though with concerns about rising foreign competition and dumping of substandard goods.

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